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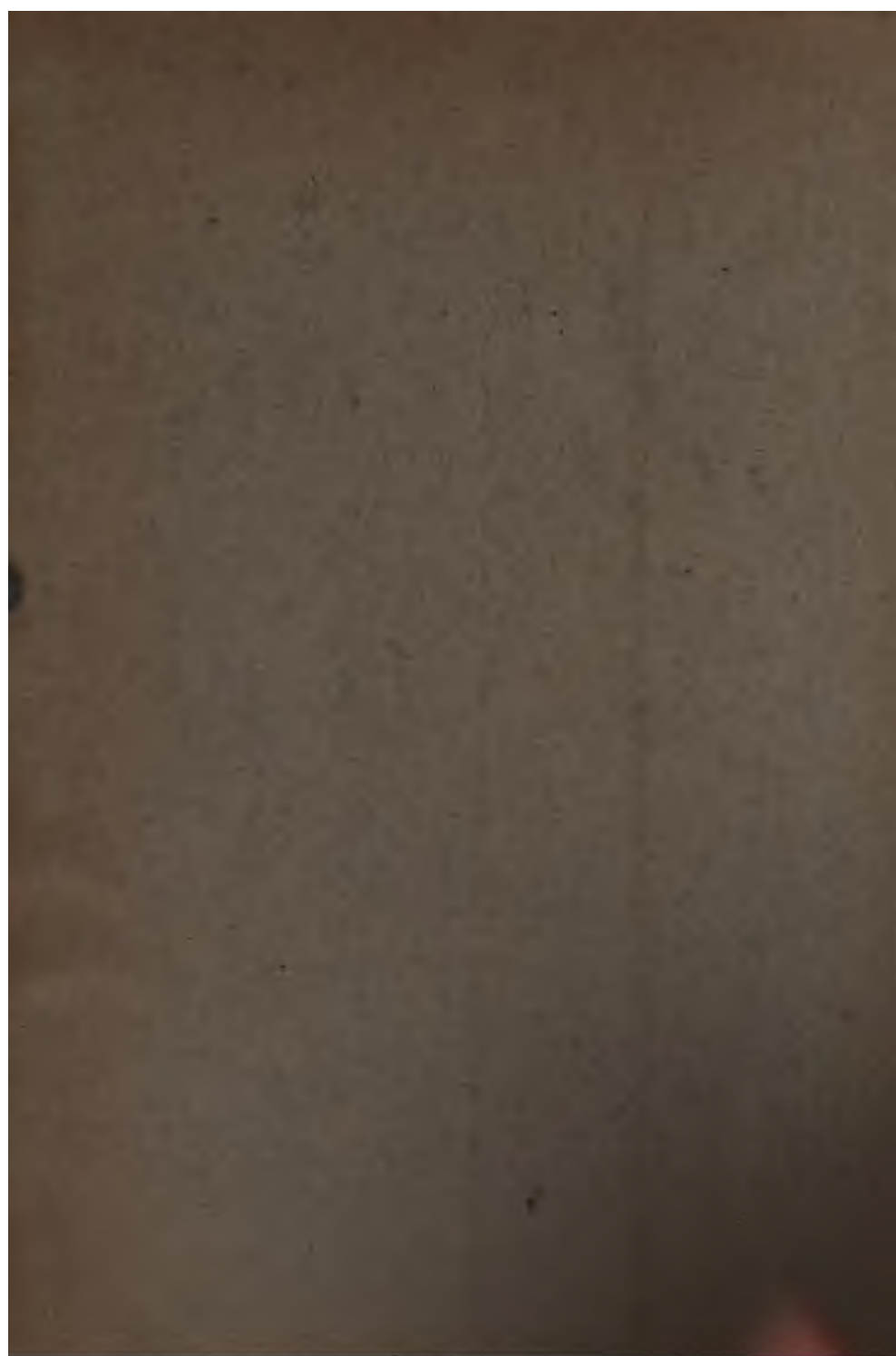
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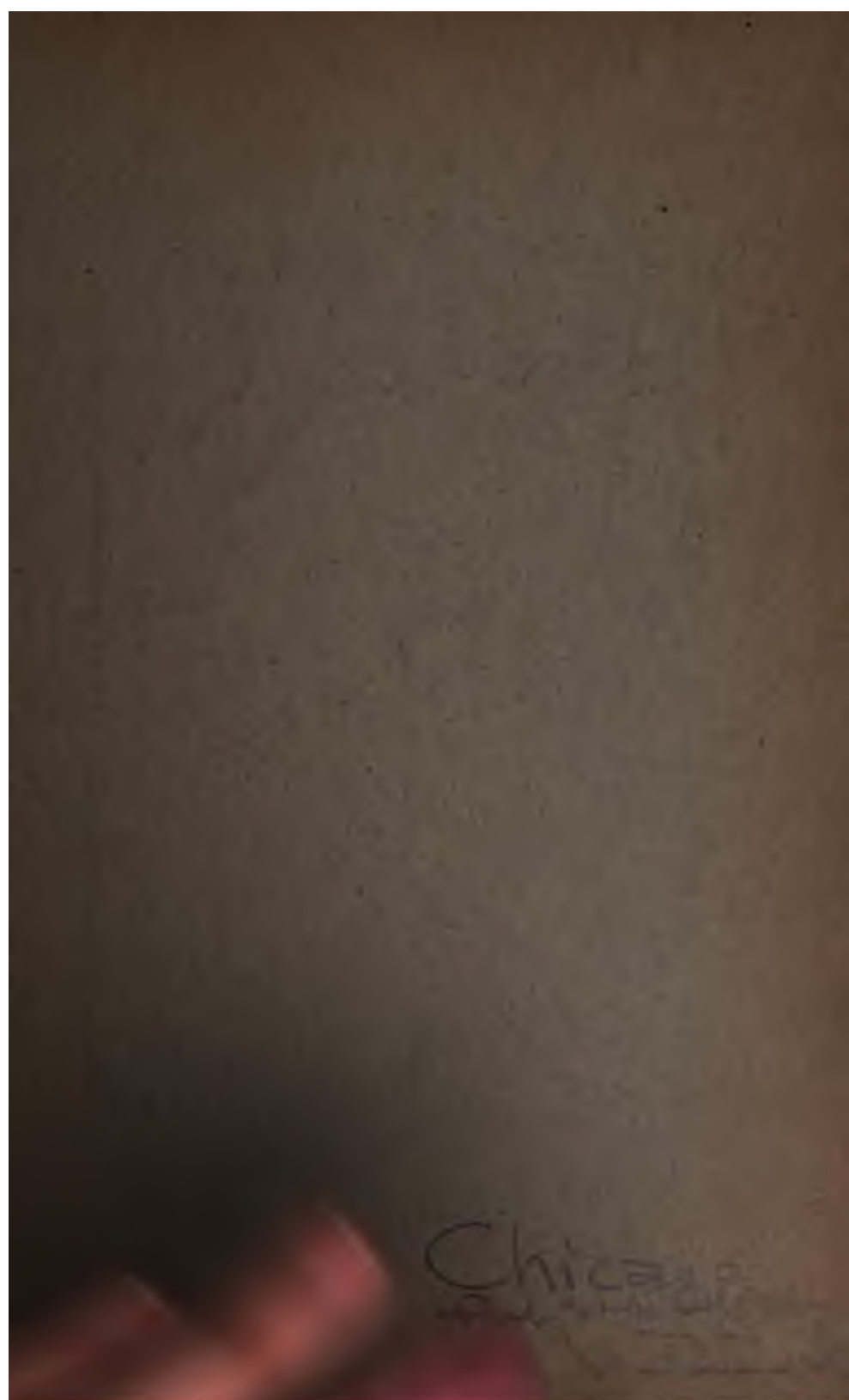
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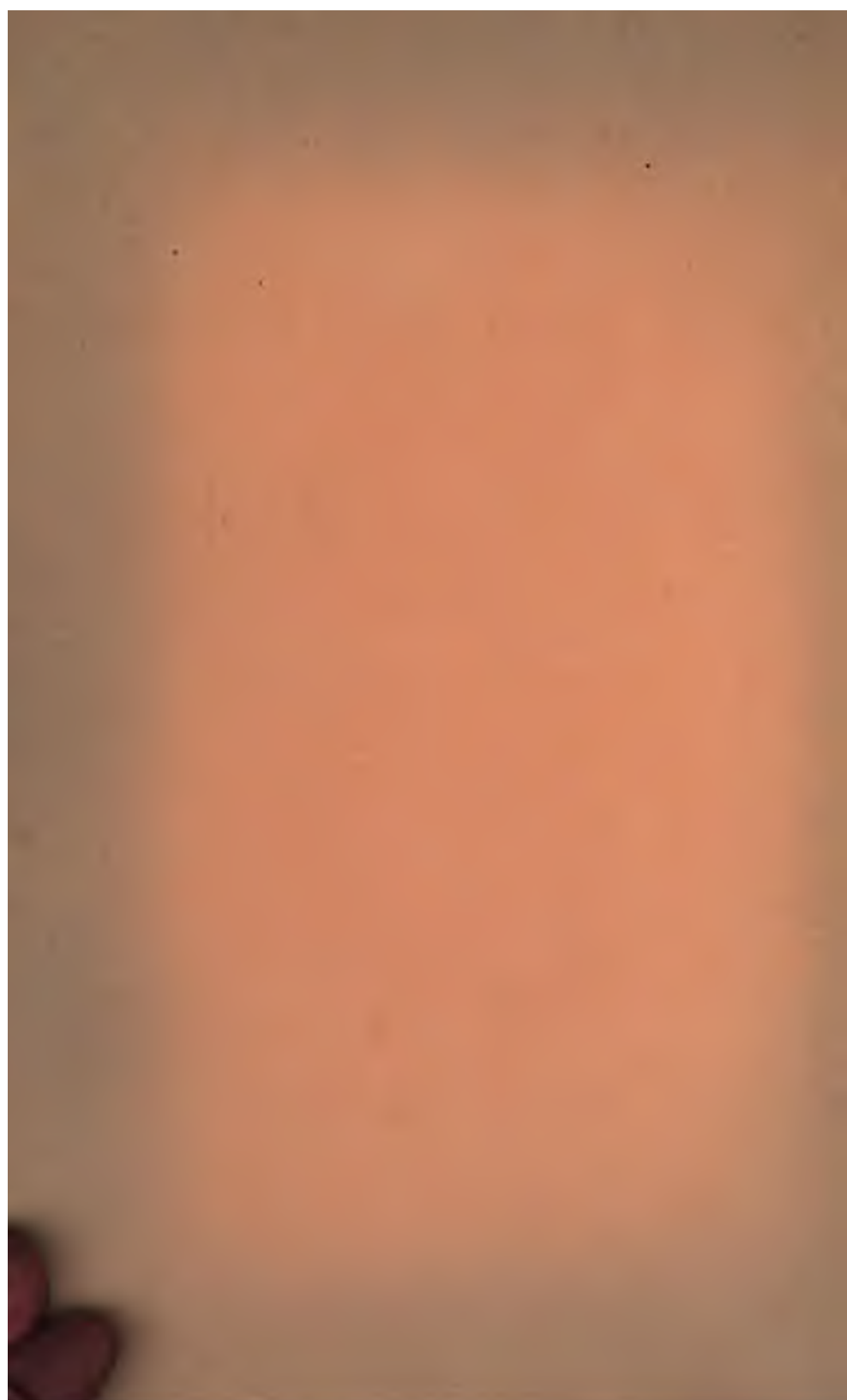




FOURTH ANNUAL REPORT
OF THE
DEPARTMENT
OF
PUBLIC WORKS

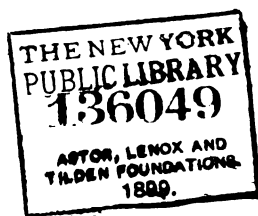
TO THE
CITY COUNCIL OF THE CITY OF CHICAGO,
FOR THE FISCAL YEAR
ENDING DECEMBER 31, 1879.

CHICAGO:
HAZLITT & REED, PRINTERS, 172 AND 174 CLARK STREET.
1880.



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DEPARTMENT OF PUBLIC WORKS.

OFFICERS:

CHARLES S. WALLER,

COMMISSIONER.

D. S. MEAD, DEWITT C. CREGIER,

Secretary.

Acting City Engineer.

DEPARTMENTAL:

WILLIAM FOGERTY.....*Superintendent of Streets, etc.*

E. M. JOHNSON.....*Accountant and Paymaster.*

H. J. JONES.....*Superintendent of Special Assessments.*

D. C. CREGIER.....*Chief Engineer North Pumping Works.*

HENRY MASON.....*Engineer West Pumping Works.*

General HERMAN LIEB.....*Superintendent of Water Office.*

O. F. WOODFORD.....*Water Tax Assessor.*

M. RYAN.....*Superintendent of Water Meters.*

JOHN HISE.....*Cashier.*

F. O. MEYER.....*Superintendent of Map Department.*

COMMISSIONER'S REPORT.

OFFICE OF THE DEPARTMENT OF PUBLIC WORKS,
CHICAGO, May 1, 1880.

*To the Honorable Mayor and City Council of the City of
Chicago :*

GENTLEMEN: I submit herewith the Fourth Annual Report of the Department of Public Works, being for the year ending December, 31, 1879.

I was appointed and qualified as Commissioner of the Department on the 19th of May, 1879, consequently during a little more than seven months of the year this Department was under my charge.

The whole work done by the Department of Public Works during the year 1879, gathered into aggregates and briefly shown, was as follows :

STREET WORK.

Streets paved, 36,090 feet, as follows:

With Wooden Blocks	28,712 feet.
“ Medina Stone	1,695 “
“ Macadam	665 “
“ Cobble Stone.	209 “
“ 3-inch Oak Plank.....	2,167 “
“ Cinders	2,642 “

Total ~~64,419~~_{3,378} miles, or 36,090 feet.

SIDEWALKS.

About 51 miles of sidewalks were built in 1879, to-wit: 49 miles were built of wood, and 2 miles of stone and concrete.

STREET CLEANING.

Nine hundred and twenty-five miles of street cleaning was done by contract during the year, at \$21 $\frac{50}{100}$ per mile, distributed as follows:

In North Division.....	204 miles.
In South Division.....	364 miles.
In West Division.....	357 miles.
Making.....	925 miles.

Besides this, there was expended during the year for street repairs and cleaning, as follows:

In North Division.....	\$21,872 74
In South Division.....	37,850 91
In West Division.....	59,375 03
Total.....	\$119,098 68

GAS LAMPS.

The whole number of Lamps repaired during the year was 16,221. Number of new lamps put in, 558. The number of street lamps broken during the year averaged 45 per day. The lighting of the city cost, in 1879, as follows:

Chicago Gas Company's bill.....	\$98,964 36
People's Gas Company's bill.....	125,101 83
Total.....	\$224,066 19

WATER WORKS.

Whole quantity of iron water pipes laid during the year 1879, was 69,567 feet, 13 $\frac{927}{5280}$ miles.

(The sizes are given in detailed report of City Engineer.)

The whole number of Hydrants put in.....	3,230
The whole number of Stop-valves put in.....	2,992
The whole number of new Meters put in.....	212

The whole number of Water Engines connected to Elevators, etc.....	26
--	----

SEWERS.

The whole amount of Sewerage put in during the year 1879, was 145,381 feet, $27\frac{2821}{80}$ miles.

Number of Catch-basins built.....	820
Number of Man-holes built.....	1,043

BRIDGES AND VIADUCTS.

Fifteen bridges and viaducts were thoroughly painted during the year, and considerable repairs were necessarily made. A new bridge was built at Kedzie avenue.

NEW CITY HALL.

The amount expended in the progress made in the erection of the new City Hall, during the year 1879, was.....	\$188,261 38
---	--------------

ENGINE HOUSE.

Built under the supervision of the Department, on Maxwell street, cost.....	\$7,100 00
---	------------

FULLERTON AVENUE CONDUIT.

Machinery house, river connections, dock, etc., work done at a cost of	\$24,086 03
Steam Machinery put in, contract price.....	21,900 50

CHICAGO RIVER.

One hundred and twenty-four thousand nine hundred and nineteen cubic yards were dredged out during the year, under contract at an aggregate cost of	\$45,100 43
An average of a fraction over 36 cents per cubic yard.	

I am trying to do more of this work in one season for less money.

LAKE CRIB.

But few repairs needed during the year.

A small Boiler was put in, costing..... \$547 00

TWELFTH STREET OUTLET.

Amount expended on this outlet.....\$2,785 78

TWENTY-SECOND STREET OUTLET.

Amount expended on this outlet.....\$4,415 49

PARKS.

But slight improvements were made in the various small parks throughout the city during the year 1879. The disbursement being chiefly for maintenance, as follows :

Union Square.....	\$ 211 40
Washington Park.....	.509 50
Ellis Park.....	474 00
Lake Park.....	1,736 12
Jefferson Park.....	725 97
Union Park.....	1,335 12
Vernon Park.....	778 98
Wicker Park.....	715 25
Campbell Park.....	221 00

The appropriations subject to the use and requirements of this Department for the year 1879, (except for construction of new City Hall):

Amounted in the aggregate to.....\$1,068,548 09

Of this was expended during the year 1879, in all. 774,732 67

Leaving a balance unexpended of..... \$293,815 42

For details of expenditures, and a full and clear showing of all the accounts of the Department, see the elaborate report of the faithful and efficient chief book-keeper herewith accompanying.

CHICAGO WATER-WORKS.

At the Pumping Works, North Side (four engines), the total quantity of water pumped during the year 1879, was 11,153,102,981 gallons; the daily average was $30\frac{1}{2}$ million gallons; during the month of January, 1879, the daily average was $36\frac{3}{4}$ millions. At the Pumping Works, West Side (two Engines), the total quantity of water pumped during the year 1879, was 9,404,558,000 gallons, the daily average was $25\frac{3}{4}$ millions. During the month of May, 1879, the daily average was $27\frac{3}{4}$ millions nearly. The total quantity of water pumped at both Pumping Works during the year 1879, was 20,557,690,981 gallons.

COAL USED.

	POUNDS.
At North Pumping Works during the year 1879....	19,983,140
General average per day	54,748
At West Pumping Works, during the year 1879....	17,132,051
General average per day.....	46,610
The expense of running the North Pumping Works	
during the year 1879, was in all.....	\$78,239 75
The expense of running the West Pumping Works	
during the year 1879, was in all	50,715 44
(For details, see the chief bookkeeper's report, herewith accompanying.)	

The cost of pumping the water at North Pumping Works for past nine years has been as follows:

In 1871, per million gallons	\$11 31
" 1872, " " "	12 02
" 1873, " " "	11 64
" 1874, " " "	12 86
" 1875, " " "	10 81
" 1876, " " "	9 56
" 1877, " " "	7 09
" 1878, " " "	6 24
" 1879, " " "	5 65

The cost of pumping the water at the West Pumping Works since commencement has been as follows:

In 1877, per million gallons	\$ 6 66
" 1878, " " "	5 45
" 1879, " " "	5 02

The entire cost of the whole water system of the city up to December 31, 1879, was \$8,550,374.40, as follows:

Whole cost May 6, 1861, when Board of Public Works was organized\$1,020,160 21

Less transferred to North Pumping Works account
for cost of two engines and \$5,000 for cost of
lot 88,500 00

Leaving\$ 931,660 21

Cost of Water Pipe laid since 1861.....	\$4,736,978 17
Cost of North Pumping Works.....	807,249 44
Cost of West Pumping Works.....	510,619 46
Cost of Lake Tunnel.....	464,866 05
Cost of Second Lake Tunnel.....	415,709 36
Cost of Land Tunnel, extension of Lake Tunnel to West Pumping Works.....	542,912 63
Cost of Lake Tunnel Crib.....	70,253 31
Cost of New Shore Inlet.....	42,871 17
Cost of West Reservoir.....	1,702 87
Cost of Water Works Shops.....	25,551 73

Total.....\$8,550,374 40

Total Income from Water Rents to December 31,
1879.\$10,334,655 35

Total Operating Expense to December 31, 1879,
including interest on the bonded debt..... 8,644,754 94

Surplus of Income over Operating Expenses \$1,689,900 41

BONDS.

Water Loan Bonds, 7 per cent., outstanding Decem-
ber 31, 1879.....\$3,625,000 00

Water Loan Bonds, 6 per cent., outstanding Decem-
ber 31, 1879..... 622,000 00

Total unpaid Water Loan Bonds.....\$4,247,000 00

Balance in City Treasury to credit of Water Fund,	
December 31, 1879.....	\$501,414 83
Of this is suspended in Gage defalcation.....	164,000 00
Leaving available.....	\$337,414 83

The following table exhibits the amount of Water furnished, and the revenue per million gallons received annually, by the city from the year 1858 to 1879, inclusive:

YEAR.	MILLION GALLONS FURNISHED.	REVENUE.	REVENUE PER MILLION GALLONS.
1858	1,092	\$102,178 85	\$93 57
1859	1,415	122,753 50	86 70
1860	1,717	131,162 73	76 39
1861	1,767	131,035 10	74 15
1862 (fifteen months)...	2,705	188,448 25	85 00
1863	2,336	192,246 39	82 29
1864	2,523	224,902 57	89 14
1865	2,778	253,114 49	91 11
1866	3,169	302,017 59	95 30
1867	4,232	338,929 28	80 08
1868	5,375	420,686 94	78 26
1869	6,801	476,968 24	70 13
1870	7,945	539,180 19	67 86
1871	8,423	445,834 64	52 93
1872	10,051	544,465 90	54 17
1873	11,723	708,804 32	60 46
1874	13,903	705,926 64	50 77
1875 (nine months)...	10,957	635,996 54	58 04
1876	15,346	771,940 38	50 30
1877	19,047	908,509 64	47 70
1878	19,564	944,190 97	48 31
1879	20,557	922,001 26	44 85

WATER COLLECTION DEPARTMENT.

The whole amount collected during the year ending December 31, 1879, was \$922,011.26. Very great changes have been made in this Department under the present administration.

The former manner of keeping the books was very loose, careless and reprehensible, wholly devoid of system and the necessary checks to detect errors and prevent dishonesty. The examination of the books for three or four years back, disclosed the fact that considerable embezzlements had taken place without detection or even suspicion. There was no check upon the division clerks who kept the accounts for water rates, and entered all credits for payments made; the receipts given were merely stamped. A duplicate of this stamp could be easily obtained, and a division clerk possessing one, could give fraudulent receipts to any extent and pocket the money received without fear of detection. The checks against the cashier were incomplete and wholly unreliable. When it is remembered that nearly a million of dollars is collected at this office annually, the necessity of having a better system for the protection of the city's interest is very apparent. Such a system has been inaugurated and is now in complete and successful operation. Instead of paying money to the several clerks to be handed by them to the cashier, the office has been completely reorganized and rearranged, so that the public now pays direct to the cashier. No one else is permitted to receive money. A registry has been established, receipts are not valid unless countersigned by the registrar, to be registered and countersigned before given out; this is a check upon the cashier as well as upon the division clerks. The registry is a complete record of the several sums received by the cashier each day, and his aggregate of cash at night must agree with the footings of the registry. The division clerks prepare the receipts upon which payments are made to the cashier, requiring his stamp and the registrar's counter-signature to make them valid. With each receipt the division clerk prepares and hands a duplicate in brief, which, when payment is made, is stamped by the cashier and returned to the division clerk as a voucher for his credit entry. The aggregate of these vouchers in the hands of each division clerk at the close of each day's business must agree with the registry and the cashier's account of cash, and thus there is a complete check all around, required to be exact on all sides, and compared and balanced each day by the several parties having charge thereof before leaving the office. The money received is promptly paid over to the City

Treasurer each day. The account thereof being made up and certified to as follows :

1. Each division clerk certifies to the aggregate sum of the vouchers he has received back from the cashier, and by which his credit entries for the day have been made. The grand total of these certificates of aggregates from the five division clerks, and meter and permit clerks, constitutes the whole amount received and to be paid over by the cashier.

2. The entire registry for the day shows this grand total exactly, and the registrar certifies that it is so shown by his books.

3. The cashier also certifies that it is the whole and true amount received by him that day, which sum he pays over and obtains a receipt for, and the settlement of each day's collections thus stated and authenticated is filed as a voucher.

With this system faithfully carried out, the city can never be wronged to the amount of one cent, without being promptly detected. Under the old system, collectors were receiving money; division clerks and their assistants; the cashier and his assistants, and almost every one else connected with the office, and no check upon any one that a boy of ten years of age could not have evaded. It is really marvelous that under such plain opportunity and consequent temptation, the city received as much money as it did. Under the new system, although a registry has been added, and a new division created to divide up the work properly, and to expedite the daily transactions of the office to accommodate the public, a very great saving and retrenchment has been effected; forty three men connected with the various duties of the Department, have been lopped off as unnecessary, and the aggregate expense for salaries has been reduced from \$77,396.88 per annum to \$45,288.75, a saving therein of \$32,108.13 per annum. But a greater saving per annum to the City Treasury than this has been effected by the reorganization of this Department and the perfect system under which it is now working, as the following figures conclusively prove, to-wit:

The whole amount collected from Water Rates for the year ending December, 31, 1879, as heretofore stated was	\$922,011 26
The whole amount collected for same the previous year, to-wit, 1878, was...	\$944,190 97
Reduction from the whole tax collectable of 25 per cent. on the frontage rates, collected in 1878, but stricken off by Ordinance from the collections of 1879.....	113,000 00
	831,190 97
Shows a balance in favor of the collections of 1879, over the collections of 1878 of.....	90,820 29
Deduct from this the new assessments under the growth of the city, added to the books of 1879, and not upon the tax lists of 1878.....	16,635 00
Shows a balance of gain per annum under the new system on the actual collections and accounting therefor, all things being equal, of.....	74,185 29
Add to this the retrenchment effected in the discharge of surplus men, causing an aggregate saving in salaries per annum of.....	32,108 13
Shows an aggregate of savings per annum in this Department under the reforms instituted, of...	\$106,293 42

In addition to the money saved, the people are being waited on with a promptness and accuracy which gives general satisfaction.

STREET PAVING.

The question as to the best and most desirable mode of paving streets, is recognized to be of so much importance that it is attracting not only considerable attention in Chicago, but also in most of the other large cities of the Union. When it is remem-

bered how necessary it is to the health and comfort and convenience of the people to have clean and well paved streets; what facilities they give to all manner of transportation and intercommunication necessary to supply the wants, and to promote the well-being of an industrious and crowded population, and how much even the sight of such improvements, when solidly done, contributes to the reputation of a commercial city, by showing a spirit in its people which favors and upholds thoroughness and reliability, it becomes a question of important consideration, and of earnest and liberal action. The cheap and short-lived wooden pavements of the city are a species of shoddy that should not be encouraged. Cheap only in the first payment—in the the long run, when aggregated, they are, in my opinion, the dearest and most unsatisfactory pavement the city has ever used. The heart or business center of a city like Chicago, where the use and the wear of the streets are so excessive, should certainly be paved with solid and durable material. I think the best quality of stone blocks that are obtainable at a reasonable expense, skillfully laid upon a thoroughly prepared and compacted road-bed, paving the gutters with select cobble stones of small and uniform size, would make the best and cleanest streets for our business center, and certainly the most durable. The paving must be general, however, or it will be impossible to keep them clean in muddy weather, with any kind of pavement. If a portion of the intersecting streets be unpaved, the continual and rapid passage of all manner of vehicles from one to the other, will always in a few hours during such weather, distribute the mud over the whole area traversed. If, for instance, every street in the entire district, bounded by the River on the north and west, by the Lake on the east, and by Van Buren or Harrison street on the south were paved as suggested, it would be a fair beginning, and this portion of the streets of the city could then be kept in such condition at all times, both as to cleanliness and repair, as would meet the wishes of our people. The expense of doing this, I am satisfied, would be cheerfully borne by the owners of lots abutting on said streets, provided the laws be so changed as to release them after doing this, from all future expense for repairs or improvements of said streets. The great anxiety lately shown by property owners to have the

streets in which they were interested, selected as park boulevards, and their willingness to pay for a superior and costly pavement, provided they were released from all expense on this account in future, has demonstrated what the feelings of a large majority of the lot owners are in this regard. As the district I have named is the business center of the city, used in common by the residents of all parts of the city, it is especially reasonable and just that after said substantial improvements shall have been made on said streets, and paid for by the owners of lots abutting thereon, that all future improvements and repairs of same should be paid for out of the general fund of the city. The streets in each division of the city over which the principal driving is done, and are as arteries through which the great daily current of travel passes to and from the heart of the city, are next in importance to be selected for the laying of smooth and durable pavements. For such as these, passing as they do by the private residences of so many of our citizens, I would avoid the noise inseparable from the stone-block pavements and substitute Macadam, constructed as follows :

Prepare the road-bed so as to be even and compact throughout, with a fifteen ton steam-roller; let the first covering be rubble-stone, carefully placed by hand, broadest surface down; cover this with 12 inches of Macadam, 6 inches at a time, thoroughly rolled to bond it well; then top it with 4 inches of crushed granite trap rock, or some other equally hard stone, accessible and not too expensive, that will not disintegrate through the action of the weather, nor pulverize into dust under the pressure and wear of vehicles upon it; roll this down thoroughly so as to compact and bond it well, and it will give not only a durable, but pleasant street to drive over. The expense will probably not be exceeding 50 per cent. more than our best wooden block pavements, while there is scarcely any limit to the durability of such a street with proper and timely repairs. If such repairs are looked after faithfully and attended to promptly, filling in with the hard stone topping wherever a street commences to wear into holes, the annual expense of doing this will not exceed five per cent. of the original cost, which expense can be easily met and should be by a light tax upon vehicles, discriminating largely in favor of

broad tires for all manner of wheeled conveyances which carry heavy loads. It will be readily seen that it is very important to keep such a pavement intact, and not allow it to be opened up or broken into. There is an ordinance now that requires sewers, water-pipes, and gas-pipes, together with the several service connections for each lot, all to be put in before a street is paved; but experience has proved that even with this precaution, there will come afterwards frequent and urgent necessities for opening a paved street. With the block-stone pavement it can easily be done and replaced, but with the Macadam such opening should be avoided. Wherever it is practicable the sewers, water-pipes, gas-pipes, etc., should be carried through the alleys of the city instead of under the paved streets. I think the difficulty may be further met and overcome in this way. Most of our streets are 38 feet from curb to curb, let the Macadam roadway be 20 feet wide only, leaving 9 feet on each side next the curb, and pave the two sides with Medina stone, or something equal to it. This will allow the opening of this part of the street, at any time, to put in pipes, etc., and the paving can be replaced, making it as good as ever, if carefully done; and if it be necessary to cross the street, then let it be done only by tunneling under the Macadam so as not to disturb it. One of the greatest drawbacks to the durability and preservation of our streets, is the continual interference with them, for the purpose of laying pipes of the various kinds for water, gas, sewerage connections, etc., and for setting telegraph and telephone poles, derrick posts and the like. As soon as a street is newly paved, this vandal work of pulling it to pieces commences, and through the careless and imperfect manner in which the replacing is done, the uniformity of the original work is broken up—the wear is unequal, and thus the paving, especially if of wood, is speedily destroyed; to have the replacing as well done as possible and with uniform care, it should be done in all cases by the city, and every one who desires to open a paved street, should be required by ordinance to deposit a sum sufficient to cover the expense of replacing it in the best possible manner, before a permit to open or displace it is granted him.

CHICAGO RIVER.

The question of keeping the river and its branches in complete navigable order, so as to provide the most ample facilities to vessels of all sizes coming to our harbor, is worthy of earnest consideration and action. While it is clearly the interest of the city to increase these facilities and thus to foster and encourage our rapidly growing commerce, the expense thereof should be so equitably adjusted and placed upon such a permanent basis, as will certainly produce the desired result. The custom for many years with the city government has been, to wait until the complaints of low water and the daily grounding of vessels were so great, that a temporary relief had to be granted, and then to dredge a single channel in the river, where most needed, and pay for it out of the general fund. As this meagre channel quickly filled up again from each side, the remedy has not only been dilatory to a very unsatisfactory degree, but ineffectual. The question is one deserving prompt and earnest attention. The river should be dredged to the full depth needed from shore to shore; if this were done whenever dredged, once in five years would be amply sufficient, and the expense, if properly distributed, would be comparatively light; while the benefit to the city, and especially to wharf owners, and to all establishments requiring wharfs, receiving and dispatching heavy cargoes on the river, would be very great, continuously so. Such a system reaching the whole evil, and providing a thorough and permanent remedy, is one of the great needs of our city. In the city charter full power is given to the Common Council, to widen and deepen the Chicago river and to make local assessments therefor. Such local assessments are being constantly made upon the owners of lots abutting on streets, which need improvements as thoroughfares; the owners of lots abutting on the river, should be assessed in like manner, to assist in keeping it navigable. The principle which governs is precisely the same, except that the necessity for the improvement, and the benefit derived from it, is greater to the owner of a wharf lot than to the owner of a lot on an ordinary street; for if the river be not navigable, the wharf lot is comparatively valueless, while the owner of a street lot is not near so dependent upon the improvement of the street in

front of his lot, because it is available and profitable to a very considerable extent without such improvement. In view of the facts thus briefly set forth, I respectfully suggest, that it would be in accordance with law and equity, as conforming to the principle of other assessments in the city, to require by ordinance, that an assessment shall be made for the thorough dredging of the Chicago river and its branches from shore to shore; placing one-third of the expense thereof on the abutting lots on one side of the river, and one-third on the abutting lots on the other side of the river, and let the remaining third of said expense be paid out of the general fund of the city. Such an arrangement, in my opinion, would be just, equitable and effectual, and would prove a great benefit to the city.

NEW CITY HALL.

Building operations were somewhat retarded on the new city hall last spring on account of an investigation ordered by the City Council, growing out of certain charges preferred by the Citizens Committee. A committee of experts was appointed by the mayor to examine the structure and the quality of stone that was being used. Pending this investigation, work was practically suspended, and consequently less progress was made than otherwise would have been during several important months of the building season, to-wit: June, July and August. Owing to arrangements which the city made last fall with the stone contractors, they have during the winter cut a large proportion of the stone for the entire building, which will so facilitate the work this summer, that it is confidently expected that the structure will be ready for the roof about the beginning of November. This will be two months earlier than the time specified in their contract. During the year a very favorable contract was made with Messrs. Thomlinson & Reed, to substitute granite columns in place of Bedford stone, to be precisely like those on the county side of the building in all respects, for the aggregate sum of \$37,000.

TELEGRAPH AND TELEPHONE POLES AND WIRES.

The immense and steadily growing demand for the erection of these, is getting to be a very serious question. The poles are huge and unsightly, the constant erection of new lines is a serious injury to our paved streets in inserting the poles. And the interminable network of myriad wires spread over the city is not only very unsightly, but a great drawback to our firemen in placing ladders against tall buildings in time of fire. In granting permits, I have made the conditions more rigid than formerly, requiring the new poles erected to be shapely, planed and painted, and reserving the right to order them removed at any time. This is a growing evil, and in the near future the city will be compelled in self defense to order all these poles to be taken down, and the wires to be laid underground.

MISCELLANEOUS DATA.

Chicago covers an area of nearly 36 square miles, or 23,040 acres. There are 789 acres in the public parks, 385 acres in the river, its branches, the slips and the Illinois and Michigan canal. The streets of the city measure 650 miles, are known by 907 names, and cover 5,200 acres. About 135 miles of the streets are paved (principally with wooden blocks). There are 716 miles of sidewalks, $322\frac{1}{4}$ miles of public sewers, and 443 miles of water pipes (mains). There are about 29 miles of river frontage (counting both sides), and 12 miles of slips and basins, making 41 miles of water frontage in the inner harbor. There are 32 bridges in the city, that cost an average of about \$25,000 each, and 18 viaducts, ranging in cost from \$6,000 to \$150,000 each.

PARKS.

Besides numerous small parks throughout the city, there are the following in the city and its suburbs:

	ACRES.
Lincoln Park	250
Humboldt Park	200

	ACRES.
Central Park.....	185
Douglas Park.....	180
South Park.....	372
Lake Shore Park.....	593

When completed in conformity with the plans adopted by the respective Park Boards, the number of miles of drives in these Parks and along the Boulevards connecting therewith will be as follows:

	MILES.
Lincoln Park.....	$3\frac{1}{2}$
Humboldt Park.....	$3\frac{1}{8}$
Central Park.....	4
Douglas Park.....	$2\frac{1}{2}$
South Park.....	$3\frac{3}{4}$
Midway Division.....	1
Lake Shore Park.....	5
	— $23\frac{1}{2}$

BOULEVARDS.

Lake Shore Drive (north to Belmont Avenue).....	$2\frac{3}{4}$
West Washington Street, from Halsted Street to Central Park.....	$3\frac{1}{4}$
Michigan Avenue, from Jackson Street to Douglas Ave- nue, thence to Grand Boulevard.....	$3\frac{3}{4}$
Humboldt Boulevard.....	3
Central Boulevard.....	$1\frac{1}{2}$
Douglas Boulevard.....	$1\frac{3}{4}$
From Douglas Park to Western Avenue, and along West- ern Avenue to Illinois and Michigan Canal....	$1\frac{7}{8}$
Western Avenue, from Illinois and Michigan Canal to 55th Street, thence to the South Park.....	$6\frac{3}{8}$
Oakwood Boulevard.....	$\frac{1}{2}$
Grand Boulevard.....	2
Drexel Boulevard.....	$1\frac{1}{2}$
	— $28\frac{1}{4}$

Total miles of drives in Parks and Boulevards. $51\frac{1}{2}$

CONCLUSION.

The Department of Public Works is composed of six sub-departments, to-wit :

The Street Department, Water Department, Engineer Department, Sewerage Department, Assessment Department, and Map Department.

The Street Department has charge of the streets, alleys, sidewalks, parks and tunnels of the city, all improvements and repairs connected therewith, together with the prevention of obstructions or injury thereto, and the sweeping and cleaning thereof.

The Water Department has charge of the assessment and collection of water rates.

The Engineer Department has charge of the pumping works, lake crib, tunnels connected therewith, the laying of water pipes, and the water system generally, together with the bridges and viaducts of the city, and the general care and improvement of the inner harbor (the river and its branches).

The Sewerage Department has charge of the construction, repair and cleaning of the public sewers, and supervision over all private drains connecting therewith.

The Assessment Department has charge of the estimation and levying of all assessments for public improvements, ordered by the council to be paid for by special assessment against the parties deemed benefited.

The Map Department has charge of the maps, showing the streets and divisions of the city, street numbers and the like.

There is no sub-department of public buildings. The new city hall is being built by the commissioner direct through the superintending architect and his assistants. All of these sub-departments are under the direction and control of the commissioner of

Public Works, all contracts are made by him, and every voucher for the vast aggregated disbursements of all these sub-departments is audited and signed by him before being paid. It will be readily seen, that a very large proportion of the annual disbursements of the city are made through the Department of Public Works, it is therefore manifest to what an important extent the financial well being of the city depends upon the vigilance, efficiency and integrity of the head of this department.

Although the great bulk of the city's work is done by contract, being advertised and let to the lowest responsible bidder, yet the average of regular employes in the Department of Public Works is over 1,000 men. Of this large force engaged in the various sub-departments of this branch of the city's service, there should be a considerable proportion of select, trained, and reliable officials to protect the interest of the city against mistakes, illegal acts, inferior work, confusion of accounts, exorbitant prices, and imposition generally. We want experienced engineers, competent and accurate book-keepers and clerks, and skilled and reliable mechanics, having charge as inspectors and supervisors over the various kinds of work, that is being continuously executed under the growing wants of the city. It is unfortunate that so many changes are liable to be made in this department every two years under the rule of party patronage. No large commercial house or manufacturing establishment, requiring the services of a great number of skilled and experienced employes, can hope to be successful, if these employes be arbitrarily changed every two years; displacing tried men who have learned to be useful, with untried men, who may prove to be worthless. The greatest evil in our country at this time, in my opinion, is the prostitution of public offices and public funds to the uses of party purposes and ends. It is a plain violation of a public trust, a palpable dishonesty, which can neither be defended nor excused. A large proportion of the applicants for public employment rely more upon the testimonials which they bring, of fidelity to party, than to fitness for the place they seek; and when thus appointed, they look to the influences which put them in, to keep them there, rather than to qualifying themselves for a faithful discharge of the duties assigned them, or to any real and effective service

which they render or expect to render, as an honest equivalent for the pay they receive. It is a fact so plain, that it needs only to be mentioned to be assented to by every intelligent, honest man in the community, that the Department of Public Works, if operated in the most successful manner for the best interest of the whole city, should be managed on business principles, rather than political. Its employes should be selected with an eye single to the public good, rejecting the incompetent, discharging the worthless and retaining only such as fill their respective places efficiently and thoroughly; men of earnest fidelity and unbending honesty, who will take a pride in doing their whole duty, and who will protect at all times the city's interests, with precisely the same jealous care and watchfulness, as they would their own. It is my deliberate opinion, that with this department thus organized and managed, as much can be accomplished for the solid improvement of the city with one million of dollars, as can be otherwise done with an expenditure of twice this sum; while the improvement it would cause to public morals by rewarding merit and discountenancing corruption would be an enduring benefit of higher and truer value to the people, than all the money that would thus be saved.

For detailed statements, showing the work of this department throughout the year 1879, and for other interesting information and statistics I refer you to the accompanying reports of the several heads of Sub-Departments; to all of whom I am much indebted for their efficient co-operation in the successful management of the department during the year, and for their uniform courtesy and kindness to me.

Respectfully submitted

CHARLES S. WALLER,
Commissioner of Public Works.

CITY ENGINEER'S REPORT.

CHARLES S. WALLER, ESQ.,

Commissioner of Public Works:

SIR: I have the honor to submit the report of the "Engineer Department" for the year ending December 31, 1879.

THE WATER WORKS

Are first in order, beginning with the twenty-seventh annual report of the North Pumping Works.

The total quantity of water pumped by these works during the year, is 11,153,102,981 gallons, being a fraction in excess of the quantity pumped during the year 1878.

The daily average pumped during the past year corresponds almost exactly with that pumped the preceding year, viz.: thirty and one-half million gallons.

The greatest daily average pumped for a single month in 1878 was in November, viz.: thirty-eight and a quarter millions; while the greatest daily average for a like period during the past year was in January, viz.: thirty-six and three-quarter millions.

The annexed tabulated record exhibits in detail the operations of engines and boilers during the year 1879.

OPERATIONS OF ENGINES AND BOILERS

AT THE NORTH PUMPING WORKS.

MONTHS, 1879.		No. of days	No. of hours run per Month. H. M.	Average No. of hrs. run per Day. H. M.	Total revolu- tions per Month.	Av. No. of revolu- tions per Day.	Total No. of gal- lons pumped month, less 5% cent. allowed for loss of action.	Av. No. of gal. pumped per day less 5% per cent. allowed for loss of action.	Pounds of coal consum- ed pr month for pumping + 56,200	Av. No. of lbs. coal consum'd per day for p'g. boilers.	Lbs. of coal consum'd per Mo. for chang. boilers.	Tot'l pounds of coal consumed per month.	Height of water in feet.	DUTY.
January	31	744.00	24.00	626,793	20,219	1,138,741,694	36,733,603	70,464	3,800	2,193,190	106.5	46,595,667		
February	28	671.15	23.58	517,801	18,492	983,647,626	35,130,265	62,239	5,300	1,747,990	103.7	48,816,152		
March	31	744.00	24.00	597,609	19,277	1,083,257,148	34,943,779	62,946	4,700	1,956,040	102.1	47,270,462		
April	30	720.00	24.00	786,738	26,224	677,241,146	22,574,705	40,760	6,800	1,229,620	97.7	45,127,434		
May	31	744.00	24.00	971,828	31,349	781,082,231	25,196,201	46,267	4,400	1,438,670	98.3	44,646,287		
June	30	720.00	24.00	920,182	30,671	755,459,026	25,181,967	45,897	4,700	1,381,610	98.0	44,843,232		
July	31	744.00	24.00	602,351	19,430	1,046,815,119	33,768,229	58,902	5,000	1,830,960	105.0	50,203,440		
August	31	744.00	24.00	640,380	20,657	1,069,289,439	34,493,207	57,527	5,100	1,788,430	105.0	52,506,615		
September	30	720.00	24.00	597,652	19,921	989,337,876	32,977,929	55,449	7,500	1,670,980	105.0	52,000,815		
October	31	744.00	24.00	603,050	19,453	1,047,124,358	33,778,205	48,070	5,300	1,752,260	105.0	52,549,350		
November	30	720.00	24.00	801,132	26,704	786,223,037	26,207,434	46,350	8,000	1,450,700	100.0	45,469,100		
December	31	744.00	24.00	976,196	31,315	794,884,381	25,641,438	49,677	2,700	1,542,690	98.0	42,186,746		
Total	365	8,759.15	23.59 ¹⁰	8,641,712	28,676	11,153,102,081	30,556,446	19,914,240	68,900	19,983,140	102.0	47,642,874		
Gen'l av. per month	---	729.56	---	720,142	---	920,425,248	---	1,650,520	---	5,725	1,665,262	---	---	
Gen'l aver. per day	---	---	23.59 ¹⁰	---	23,676	---	30,556,446	---	54,559	188	54,748	---	---	

Notes.—Coal for heating building and pumping out wells included in above amounts. + Screenings. * Coal.

The annexed table sets forth the total quantity of water pumped and the time run by the several engines, respectively:

A.

ENGINES, DESIGNATED AS.	HOURS AND MINUTES	TOTAL REVOLU- TIONS.	Total gallons of water pumped less 5% per cent. for loss of action.
	H. M.		
1853.....	2,398:41	1,426,319	680,042,421
1857.....	3,042:05	1,894,297	1,458,154,059
1867.....	3,755:22	2,486,484	2,862,635,630
1872.....	5,248:15	2,834,612	6,634,270,871
Totals.....	14,444:23	8,641,712	11,153,102,981

It will be seen that the "72" engines have pumped about three-fifths of all the water delivered from these works, and about one-third of the entire quantity used by the city.

FUEL.

Coal has been received and used as follows:

LACKAWANA COAL.

	TONS.		POUNDS.	
On hand January 1, 1879	373		110	
Received.....	10,238		630	
Used for pumping, heating build- ing, etc.....	9,931	1,540		
Used for work shop	171	1,480		
On hand January 1, 1880	507	1,720		
Total	10,611	740	10,611	740

ERIE COAL.

	TONS.	POUNDS.
On hand January 1, 1879	5	420
Received	85	640
Used for changing boilers	34	900
Used for workshop, pipe extension, etc., ...	46	150
Used for Lake Basin (shore inlet)	3	700
On hand January 1, 1880	6	1,310
Total	90	1,060

EXPENSES DUE TO PUMPING.

Salaries of engineers	\$ 6,025 89
Labor, firemen, etc.	12,963 77
9,931 $\frac{540}{1000}$ tons Lackawana coal, at an average cost of	
\$4.13 $\frac{2}{8}$ per ton	41,084 03
485 gallons of lard oil	271 83
320 $\frac{1}{2}$ gallons of cylinder oil	228 85
26 $\frac{1}{2}$ pounds of lubricating compound	10 20
249 pounds of tallow	19 42
1,181 pounds of waste	109 77
311 $\frac{1}{4}$ pounds of packing	102 07
Small stores	65 85
Gas for lighting works	1,090 18
Repairs of fire room tools	47 87
Repairs of engines and boilers	1,057 27
Total	\$63,077 00

Cost of delivering water per million gallons	\$5.65 $\frac{55}{100}$
Cost of delivering water per million gallons one foot	
high	.05 $\frac{54}{100}$
Cost of repairs and additions per million gallons	.42 $\frac{22}{100}$

DISTRIBUTED AS FOLLOWS:

To engines.....	.39 ¹⁵ ₁₀₀
To boilers.....	.03 ⁷ ₁₀₀
Subdivided as follows:	
Extraordinary repairs of engines.....	.32 ⁷⁵ ₁₀₀
Ordinary repairs of engines.....	.06 ⁴⁰ ₁₀₀
Repairs of boilers.....	.03 ⁷ ₁₀₀

The following is the cost of delivering water per million gallons during the past ten years, and cost of coal:

	Average cost of coal per ton.	Cost of million gallons.
1871.....	\$ 6 49	\$ 11 31
1872.....	8 09	12 02
1873.....	7 18	11 64
1874.....	8 56	12 86
1874-5.....	8 27	12 26
1875, (nine months only).....	7 93	10 81
1876.....	7 15	9 56
1877.....	5 38	7 09
1878, (estimated, screenings used,).....	4 39	6 24
1879.....	4 14	5 65
	\$ 6 76	\$ 9 94

The quantity pumped each month for the past ten years is as follows:

DEPARTMENT OF PUBLIC WORKS.

TABLE SHOWING QUANTITY OF WATER PUMPED AT THE "NORTH PUMPING WORKS" EACH MONTH DURING PAST TEN YEARS.

MONTH.	1870-71.	1871-72.	1872-73.	1873-74.	1874-75.	1875.	MONTH.	1876.	1877.	1878.	1879.
April	561,596,364	720,000,000	696,411,330	910,330,315	909,885,640	1,943,837,877	January ...	1,308,668,563	719,022,385	898,314,968	1,138,741,694
May	628,128,473	713,000,000	738,530,388	931,025,086	1,044,115,822	1,350,605,053	February ..	1,169,388,839	774,594,418	815,598,987	983,647,629
June	730,501,639	735,000,000	748,988,470	936,614,148	1,010,002,523	1,163,985,505	March	1,244,271,298	1,088,621,780	906,047,019	1,083,257,148
July	766,073,000	806,000,000	876,206,081	1,000,695,844	1,297,513,064	1,239,434,124	April	1,199,825,593	1,109,008,942	886,000,942	677,341,146
August	797,000,274	868,000,000	852,976,814	1,033,164,846	1,322,546,047	1,273,876,026	May	1,306,577,131	1,154,372,813	639,630,064	781,082,291
September ..	751,256,836	780,000,000	842,668,858	973,690,025	1,246,442,604	1,199,570,888	June	1,237,317,437	1,110,876,865	734,020,984	735,459,026
October	694,056,940	442,337,031	843,791,229	1,018,033,312	1,151,107,735	1,227,668,188	July	1,358,762,009	1,115,239,814	1,114,216,593	1,046,815,119
November ..	650,800,982	637,138,219	833,879,447	1,023,633,854	1,096,221,656	1,160,694,177	August	1,376,669,544	1,066,176,419	1,122,492,614	1,069,289,439
December ..	558,179,911	620,598,358	877,853,081	1,096,220,398	1,140,296,745	1,192,680,258	September.	1,243,745,869	1,012,028,066	1,050,831,050	989,337,876
January	612,621,440	684,569,031	905,391,154	955,646,283	1,193,462,490	1,193,462,490*	October	1,268,071,044	998,713,776	1,064,588,733	1,047,124,328
February ..	547,075,127	608,788,039	838,344,790	884,813,362	1,126,065,231	1,126,065,231*	November .	1,015,851,377	909,774,581	1,145,355,798	786,223,037
March	653,904,794	738,459,377	976,655,777	1,002,041,559	1,355,239,536	1,355,239,536*	December .	869,709,283	899,607,884	1,078,271,910	794,884,281
Totals	7,944,548,840.	8,423,890,966	10,050,939,189	11,722,819,032	13,903,197,469	14,642,930,253	Total	14,525,858,798	11,958,977,646	11,445,370,232	11,153,102,981

* These three months' figures were borrowed from the previous year (the commencement of the municipal year having been changed.) In order to make up twelve months' work. They exceed the actual quantity pumped by 63,238,537 gallons, but it being leap year, there were twenty-nine days in February, besides which the new pumping works were in operation.

THE SUPPLY OF WATER

has been uninterrupted during the past year, with the exception of a period on the 7th of January, 1879, when the flow through tunnels was seriously obstructed by ice at the crib. The matter was briefly referred to in the last report.

Some time ago it was determined to place a small engine and boiler at the crib for the purpose of facilitating the removal of floating ice from the interior chamber, and thereby preventing, if possible, a recurrence of the trouble experienced last winter. The machinery was erected during the past summer, and proved very serviceable on the 23d of December last, when the inlet openings were threatened with stoppage by ice. However, there has been comparatively but little trouble at the crib during the past winter, owing to the unusually mild season, the adoption of the precautionary means referred to, and the increased help temporarily stationed at the crib to keep the ice from accumulating.

In November last the sand was thoroughly removed from the "shore-inlet." The lake end rearranged and improved. The apparatus for operating the gates was painted, and the whole put in good order for immediate use when required; but fortunately nothing has since occurred to necessitate its operation.

The depth of water at the mouth of this inlet is very shallow, owing to the accumulation of sand, and with the wind off shore, it would be difficult in case of necessity to obtain an adequate supply of water for the city. I would therefore recommend that either the inlet be extended a few feet further into the lake, where the water is deeper, or what would be far more reliable and permanent, that a sub-tunnel be constructed as proposed in the original plans, for the purpose of meeting any probable contingency that might interrupt the flow of water from the crib.

The "gate-chamber," just east of the main building, has long been in an unfinished condition. In August last the old wood roof was removed; a new one put on, composed of *I* beams and brick arches, and the outside covered with asphalt; the whole con-

stituting a substantial and enduring improvement. The iron beams used for this work were taken from the abandoned west reservoir, and the mason work was done by city men.

ENGINES.

The three oldest engines, viz.: "53," "57" and "67," remain in as good condition as last reported. They have not required or received any extended repairs beyond what is due to ordinary wear. The service of each during the year is noted in table "A," page 27.

The thorough refitting of the pumps of "72" engine, referred to in last annual report, was completed in June last, and has proved a great improvement. The engine was started soon after and has continued in operation day and night since that date, working in the most satisfactory manner and at the present time is in prime condition. No accident or breakage of any kind has occurred during the year.

THE BOILERS,

with one exception, are in same condition as last reported.

BUILDINGS.

Nothing has been done to the buildings during the year. No important repairs are needed except the roof and ceiling of main building, the dilapidated condition and unsightly appearance of which have been referred to in former reports.

Several efforts have been made to repair the roof proper, but without success. It is a weak and poorly adapted structure; it would be a waste of time and money to repair the ceiling until the roof itself is made tight and otherwise substantial. The most effectual way of accomplishing this object, and in the end the cheapest, is to replace the present roof with a new one of proper strength and suitable material.

THE TOWER

is in good condition, the only repairs needed being the resetting of some of the small stones on the upper parapet.

THE GROUNDS

west of main building remain in good order. During the year a number of thrifty trees were set out. By the kindness of the commissioners of Lincoln Park in furnishing foliage, etc., the grounds are made attractive and pleasant. The eastern portion, however, is the reverse. At a small expense it could be made to correspond with other parts of the premises, an improvement which should be made at an early day.

MISCELLANEOUS.

In June last new telephones were put in, connecting as heretofore, and also with the Fullerton avenue conduit.

On the 15th of September last, George Brown died suddenly while on his way to the works. Deceased had long been a faithful and trusty employe of the works, and at the time of his death was an assistant engineer. With this exception, there has been no change in the force employed at the works. Nearly all the assistant engineers and employes have been connected with the works for many years, discharging their respective duties with zeal and fidelity.

SHOPS.

Hydrants, stop-valves, etc., have been manufactured during the year as follows :

NEW HYDRANTS.

Four-inch (double-nozzle).....	114
Two-and-a-half-inch (double-nozzle).....	8
Two-and-a-half-inch (single-nozzle).....	31
Total manufactured.....	153
Of these there have been put in use.....	149
On hand January 1, 1880.....	4

NEW STOP-VALVES.

Four-inch	63
Six-inch.....	121
Eight-inch.....	69
Twelve-inch	30
Sixteen-inch	3
Twenty-four-inch.....	1
Total manufactured	287
Of this number there have been used.....	252
Leaving on hand January 1, 1880.....	35

Of the following sizes, viz:

Four-inch.....	17
Six-inch.....	9
Eight-inch.....	2
Twelve-inch.....	5
Sixteen-inch.....	2
Total	35

The above list includes the hydrants and valves reported on hand January 1, 1879, which were carried over as "stock" on hand.

In addition to the foregoing work, a number of hydrants and stop-valves have been repaired, and the usual amount of repairing has been done for the various departments of the city.

The total expenditures for labor and material on account of shop, including value of stock on hand, January 1, 1880, is\$18,758 50

Charged to the following accounts, viz.:

Water department, "pumping,"	\$1,129 88
Water department, operating expenses..	838 44
New hydrants and stop-valves.....	10,003 95
Pipe extension	426 33

Meter department	56	16	
Tapping department	103	97	
Sewer department	53	99	
Fullerton avenue conduit	299	96	
City Hall, "Council Chamber,"	1	31	
Street department	28	77	
Fire department, (coal, repairs, engines, etc.)	589	86	
Expenses running shop, coal, gas, etc. ..	1,333	87	
Superintendence deducted from engi- neer's salary	270	00	
Stock on hand January 1, 1880	3,622	01	
	\$18,758	50	\$18,758 50

The value of the work done in the shop, estimating the same at less than current prices for like articles, is	\$23,201	49	
Add coal, attendance, etc., used by Fire department ..	539	23	
Deduct cost as shown	\$18,758	50	
Deduct 10 per cent. for interest and de- preciation of tools, etc., costing \$7,065.06	706	50	
Leaving the nominal net earnings of shop	4,275	72	
Total	\$23,740	72	\$23,740 72
Cost of tools previously reported	\$6,910	44	
Added by repairs, past year	154	62	
Present value of tools	\$7,065	06	
Value of stop-valves and hydrants, before noted, as on hand January 1, 1880, together with the raw material in the shop, is	3,622	01	
Total value of stock and tools	\$10,687	07	

In May, last, the exterior surface of the walls was painted with three coats of oil and lead, greatly improving the appearance of the building.

WEST PUMPING WORKS.

The Engineer in charge of the West Pumping Works presents the following report and tabulated statement of the operation of the engines and boilers at that station:

CHICAGO, ILL., March 1, 1880.

D. C. CREIGER, ESQ.,

Acting City Engineer :

SIR: The fourth annual report of the operations of these works being for the year ending December 31, 1879, is herewith submitted.

ENGINES.

Both engines have been in operation during the entire year, and have performed their duty in a most satisfactory manner. The head has been about six (6) feet lower than during the preceding year, but quite uniform. The necessity of more machinery at these works was spoken of in the last report, and their need is sensibly felt.

BOILERS.

The boilers are in good condition and working satisfactorily, requiring but little repairing during the year.

The contract for furnishing coal between the "City" and "McMullen Bros.," ended on November 30th, after which time we commenced using coal furnished by the city.

GROUNDS AND BUILDINGS

Are in about the same condition as stated in the last report, no improvements whatever having been made. The roof of fire room, which was reported in a bad condition last year, has received no improvement yet; this roof needs repairing very much. Two or three ventilators are also required in the roof to carry off the gases from the fire room.

The south wall of the main building has been braced by three (3) heavy shores, as I found it settling some time ago. This wall (as you are aware) is but temporary, until the completion of another pair of engines, when the building will be completed as originally designed.

FLOOR.

The floor (basement) between the engines has not as yet been built. This floor is a "necessity" and I would like to see it completed as soon as possible.

FORCE.

Engineers Stewart, Hill, and Commons, as well as all others constituting the working force, still remain in the active discharge of their respective duties.

Respectfully,

HENRY MASON, *Engineer.*

OPERATIONS OF ENGINES AND BOILERS

AT THE WEST PUMPING WORKS.

MONTHS. 1879.	No. of Days	No. of hours run per month. H. M.	Av. No. of hours run per day. H. M.	Total revolu- tions per month.	Av. No. of revolu- tions per day.	Total No. of gallons of water pumped per month less 5% per ct. allowed for loss of action.	Av. No. of gal- lons of water pumped per day less 5% per cent for loss of action.	Pounds of coal consumed per month for pumping.	Av. No. of lbs. of coal consumed per day for pump- ing.	Total lbs. of coal consumed per month.	Height of water in feet.	DUTY.
January	31	744:00	24:00	845,958	27,289	845,958,000	27,288,970	1,593,380	51,399	1,602,954	108.9	46,005,569
February	28	672:00	24:00	775,107	27,082	775,107,000	27,082,393	1,437,800	51,350	1,464,080	108.46	46,515,926
March	31	744:00	24:00	846,632	27,301	846,632,000	27,310,710	1,533,400	49,464	1,533,350	99.7	45,893,006
April	30	720:00	24:00	823,136	27,437	823,136,000	27,437,533	1,445,800	48,193	1,450,200	98.48	46,759,682
May	31	744:00	24:00	858,911	27,706	858,911,000	27,706,806	1,523,000	49,130	1,533,053	98.66	46,403,941
June	30	720:00	24:00	820,662	27,355	820,662,000	27,355,400	1,442,500	48,083	1,448,600	101.64	48,225,740
July	31	744:00	24:00	738,578	23,825	738,578,000	23,825,097	1,433,991	46,258	1,438,991	99.	42,525,450
August	31	744:00	24:00	735,461	23,724	735,461,000	23,724,548	1,451,098	46,098	1,455,398	98.38	41,985,521
September	30	720:00	24:00	675,686	22,522	675,686,000	22,522,866	1,363,398	45,446	1,369,989	99.2	41,001,542
October	31	744:00	24:00	688,678	22,215	688,678,000	22,215,420	1,387,600	44,761	1,393,100	101.7	42,095,765
November	30	720:00	24:00	764,259	25,475	764,259,000	25,475,300	1,160,400	38,680	1,189,136	103.82	51,026,872
December	31	744:00	24:00	831,530	26,823	831,530,000	26,823,548	1,240,300	40,010	1,246,600	101.84	56,942,308
Total	365	8,760	-----	9,404,588	-----	9,404,588,000	-----	17,012,667	-----	17,132,051	100.815	46,479,142
Gen'l av'ge per month	-----	730	-----	783,715	-----	783,715,667	-----	1,417,722	-----	1,427,671	-----	-----
General av'ge per day	-----	24:00	-----	25,766	-----	25,765,994	-----	46,610	-----	46,937	-----	-----

NOTES.—Contracts for furnishing necessary fuel per million gallons pumped, ended October 31st, after which time Erie and Lackawana coal was used. Coal for heating building and pumping out well included in above amounts.

The annexed table sets forth the total quantity of water pumped and the time run by the two engines respectively.

ENGINES DESIGNATED AS	HOURS AND MINUTES. H. M.	TOTAL REVOLUTIONS.	TOTAL GALLONS OF WATER PUMPED. LESS $5\frac{2}{3}$ PER CENT. FOR LOSS OF ACTION.
No. 25.....	8,230:20	4,705,096	4,705,096,000
No. 26.....	8,218:55	4,699,492	4,699,492,000
Totals.	16,444:15	9,404,588	9,404,588,000

FUEL.

Coal has been received and used as follows :

	TONS.	POUNDS.
Erie coal on hand Jan. 1, 1879	447	60
Lackawana coal on hand Jan. 1, 1879.....	14	1,560
Received of Pittsburgh coal.....	52	400
Received of Lackawana coal.....	1,024	1,555
Used for pumping, heating building, etc. :		
Erie coal for special contract.....	199	480
Erie coal for special contract.....	247	1,580
Pittsburgh coal.....	52	400
Lackawana coal.....	917	1,720
On hand Jan. 1st, 1880.....	121	1,395
Total.....	1,538	1,575

The following statement and tables are added, in connection with the operation of the West Pumping Works :

EXPENSES DUE TO PUMPING

At the West Pumping Work, are gleaned from the books of the Department :

Salaries of engineers, firemen, laborers, etc.	\$19,255.62
Cost of pumping, by special contract	17,673.56

917 $\frac{72}{1000}$ tons of Lackawana coal, at an average cost of \$3.66 $\frac{2}{3}$ per ton.....	3,364.92
282 $\frac{280}{1000}$ tons of Pittsburgh and Erie coal at an average cost of \$4.29 per ton.....	1,240.50
867 gallons of cylinder oil.....	937.95
906 $\frac{1}{2}$ gallons of lard oil.....	519.55
851 pounds of lubricating compound.....	258.05
1,889 pounds of waste.....	179.61
402 pounds of packing.....	301.50
Small stores.....	60.12
Gas for lighting works.....	1,586.10
Repairs of boilers.....	1,302.00
Repairs of engines.....	577.70
Total.....	\$47,257.18

Cost of delivering water per million gallons.....	\$5.02 $\frac{49}{100}$
Cost of delivering water per million gallons, one foot high.....	.04 $\frac{98}{100}$
Cost of repairs per million gallons.....	.23 $\frac{19}{100}$

DISTRIBUTED AS FOLLOWS:

To engines.....	.17 $\frac{5}{100}$
To boilers....	.06 $\frac{14}{100}$

The following is the cost of delivering water per million gallons during the past three years, and cost of coal at the west works:

	Average cost of coal per ton.	Cost per mil- lion gallons.
1877.....	\$5.22	\$6.66
1878 (Estimated) screenings used.....	3.67	5.45
1879 (Estimated) screenings used.....	2.62	5.02
	\$3.84	\$5.71

OPERATIONS OF BOTH PUMPING WORKS COMBINED.

MONTHS.			1879.												DUTY.	
No. of Days.	No. of Hours run	Av. No. of hours run	Total Revolutions per Month.	Average No. of Revolutions per day.	Total No. of gal- lons of water pump- ed per month, less 5% per cent. allowed for loss of action.	Average No. of gal- lons of water pump- ed per day, less 5% per cent. allowed for loss of action.	Pounds of coal con- sumed per month for pumping.	Av. No. of pounds of coal consumed per day for pumping.	Pounds of coal con- sumed per month for changing boilers.	Total lbs. of coal consumed per month.	Height of water in feet.	DUTY.				
January	31	744	24	1,472,751	47,508	1,984,699,694	64,092,573	3,777,770	121,863	18,374	3,796,144	105.2	46,093,590			
February	28	672	24	1,392,908	46,174	1,758,754,626	62,812,058	3,180,490	113,589	32,180	3,212,670	103.6	47,778,973			
March	31	744	24	1,444,241	46,578	1,929,839,148	62,254,489	3,484,740	113,410	6,650	3,491,390	100.9	46,903,490			
April	30	720	24	1,609,864	53,661	1,500,367,146	50,012,238	2,668,620	88,953	11,200	2,679,820	98.1	45,976,625			
May	31	744	24	1,830,739	59,055	1,639,993,231	52,903,007	2,957,270	95,397	14,453	2,971,723	98.5	45,556,742			
June	30	720	24	1,740,844	58,026	1,576,121,026	52,537,367	2,819,410	93,980	11,800	2,831,210	99.82	46,538,779			
July	31	744	24	1,340,929	43,255	1,785,393,119	57,593,326	3,259,951	105,160	10,000	3,269,951	102	46,589,520			
August	31	744	24	1,375,841	44,381	1,804,750,439	58,217,755	3,234,428	103,625	12,400	3,246,828	101.7	47,326,705			
September	30	720	24	1,273,338	42,443	1,665,023,876	55,500,795	3,026,878	100,895	14,091	3,040,969	102.1	46,840,008			
October	31	744	24	1,291,728	41,668	1,735,892,358	55,993,625	3,134,560	101,114	10,800	3,145,360	103.35	47,730,957			
November	30	720	24	1,565,391	52,179	1,550,482,037	51,682,734	2,602,500	86,750	37,336	2,639,836	101.91	50,635,919			
December	31	744	24	1,807,726	58,138	1,626,414,281	52,464,976	2,780,290	89,687	9,000	2,789,290	100	48,787,300			
Total	365	8,760	24	18,046,300	49,442	20,557,690,981	56,322,441	36,926,907	101,169	188,284	37,115,191	101.4	47,079,817			
General average per month	30	730	24	1,503,858	49,442	1,713,140,915	56,322,441	3,077,242	101,169	15,690	3,092,933	101.4	47,079,817			
General average per day	30	730	24	1,503,858	49,442	1,713,140,915	56,322,441	3,077,242	101,169	15,690	3,092,933	101.4	47,079,817			

CITY ENGINEER'S REPORT.

TABLE SHOWING TOTAL QUANTITY OF WATER PUMPED BY BOTH PUMPING WORKS COMBINED;
TOGETHER WITH ANNUAL AND DAILY INCREASE IN QUANTITY AND RATE PER CENT.; ALSO, THE GREATEST DAILY AVERAGE FOR A SINGLE MONTH, FOR THE FOLLOWING YEARS:

YEAR.	Total Quantity Pumped. GALLONS.	Annual Increase. GALLONS.	Average daily quantity pumped. GALLONS.	Average daily increase. GALLONS.	Per cent. of annual Increase.	Greatest Daily Average.	
						MONTH.	GALLONS.
1876.	15,346,922,158	-----	41,931,481	-----	-----	December -----	47,063,724
1877.	19,047,104,636	3,700,182,478	52,183,892	10,252,411	24.11	July -----	55,912,350
1878.	19,564,288,232	517,183,596	53,600,789	1,416,897	2.71	August -----	61,520,762
1879.	20,557,690,981	993,402,749	56,322,441	2,721,652	5.07	January -----	64,022,571

The pumping and cost of same for the past two years are as follows :

YEAR.	PUMPING.		COST.	
	Total No. of Gallons.	Daily average.	Total Cost.	Av. per million gallons.
1878.....	19,564,288.232	53,600.789	\$116,043.66	\$ 5.93 ¹⁴ / ₁₀₀
1879.....	20,557,690.981	56,322.441	110,384.18	5.36 ⁷⁹ / ₁₀₀
	993,402.749 INCREASE.	2,721.652 INCREASE.	\$5,709.48 DECREASE.	\$ 0.56 ⁴⁴ / ₁₀₀ DECREASE

The annexed diagram illustrates the daily quantity of water pumped by the North and West Works, respectively, and both combined :

DIAGRAM OF THE PUMP

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PUBLIC LIBRARY
ASTOR, LENOX AND
TILDEN FOUNDATIONS.

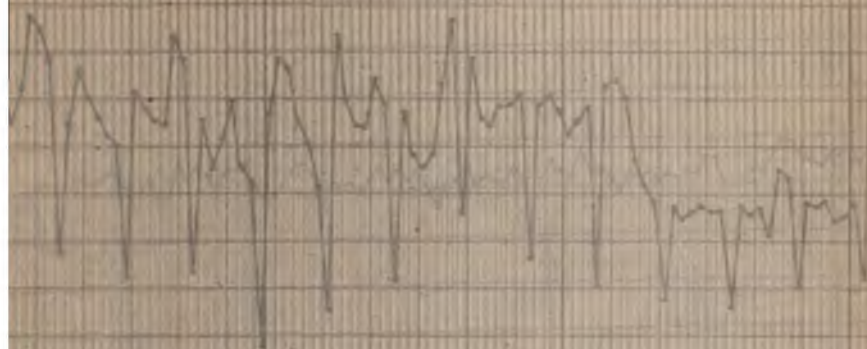


DIAGRAM OF THE PUMP

THE NEW YORK
PUBLIC LIBRARY
ASTOR, LENOX AND
TILDEN FOUNDATIONS.

THE NEW YORK
PUBLIC LIBRARY

ASTOR, LENOX AND
TILDEN FOUNDATIONS.

DAID

William Galton.

William Gallows.

Billion Gallons

CONSUMPTION OF WATER.

The subjoined tabulated statement and diagram exhibits the quantity of water used in the city, during a period of twenty-one years—and includes some additional statistics presented in previous reports.

It should be borne in mind that the daily quantity of water recorded is the average for the entire years, while for certain months in each year, and on particular days in certain months, the demand greatly exceeds the annual average. For instance, during the month of January, 1879, the daily average pumped was over 64 million gallons, while the greatest daily average for a single day, was on the 4th of the same month, being nearly 74 million gallons, and for several hours during this day the demand was at the rate of over 80 millions. Assuming the population of the city at the period referred to, to have been 450,000, the average quantity for the month noted and for the largest day equals about 142 and 164 gallons per head respectively.

This excessive consumption of water was doubtless due to the enormous quantity allowed to run to waste for the purpose of protecting service pipes, etc., from the then very cold weather—the thermometer at times being 10 degrees below zero. The increased quantity used on the single day referred to was occasioned by the extensive fire which destroyed the post office building.

The least average quantity used in one month was in April last, viz., about 50 million gallons; while the least quantity used in one day was June 1st, about 43 $\frac{3}{4}$ millions.

Our population continues to increase, new industries requiring large quantities of water are being established in our midst. The pipe system is being continually extended. Last year 13 miles of pipes were laid; during the coming year 15 miles will probably be added. We may therefore reasonably expect the future increase in the consumption of water to be equal to that of the past.

The important question of the demand for and supply of water must continue to engage the attention of the proper authorities so long as our city continues to grow. This fact naturally revives the subject of

ADDITIONAL PUMPING ENGINES.

The absence of reservoir facilities renders the constant operations of adequate pumping machinery imperative.

The present total pumping capacity of the works is 104 million gallons daily, but it is hardly practicable to rely on more than 60 to 80 millions of this quantity at one time.

A glance at the statement and diagram on pages 48 and 49 reveals the fact that in 1882 the annual average increase will in all probability leave but a limited margin of the "available" capacity above the demand. But if the greatest monthly or daily requirement, which is likely to occur be considered, then the reliable pumping capacity of the works will be exceeded, and possibly, the total capacity will be reached.

However exceptionable the necessity may be for extraordinary quantities of water during a day or a month, it represents the demand for the time, and the facilities for meeting it must be ample and reliable.

More than a year ago the City Engineer reported it was absolutely necessary that immediate steps be taken to procure additional pumping machinery. The lapse of time has increased and made more apparent this necessity.

It will occupy at least two years to get the desired machinery in operation. A considerable important and expensive work essential to the erection of such machinery, was long since executed in anticipation of the present and future wants of the city.

For the reasons herein set forth it is respectfully suggested that further delay in this pressing matter will prove detrimental to the public interests. I would therefore reiterate the recom-

mendation and urge, that immediate steps be taken to secure at the earliest possible time, two additional pumping engines, having a combined capacity of not less than thirty millions gallons, to be erected at the west pumping station, thus completing these works in accordance with the original design.

TABULAR STATEMENT OF THE CONSUMPTION & WASTE OF WATER, RELATIVE PUMPING CAPACITY, POPULATION, PIPES, REVENUE, ETC.

YEAR.	WATER DISTRIBUTED DAILY IN U. S. GALLONS.										WATER RENTS			TAPS.			PIPE.			POPULATION.	
	Actual Supply.	Per Cent of Increase.	Estimated at one-sixth Annual Increase.	Estimated made in 1851 based on 35 Gallons per Inhabitant.	Quantity to each Inhabitant.	Per Cent of Increase.	Average Quantity per mile of Pipe.	Capacity of Works per mile of Pipe.	Proportion of Pumping Capacity to Quantity Supplied.	Amount Collected.	Per Cent. of Increase.	Number of Taps in Use.	Per Cent. of Increase.	Miles of Pipe in Use.	Number of Inhabitants to each Tap.	Number of Inhabitants per mile of Pipe.	Total Number.	Per Cent. of Increase.			
1858	2,991,413	29.08	3,489,980	2,340,000	32.8	10.36	41,317	276,243	1 to 9.7	\$102,170	4.696	18.10	18.10	72.4	10.5	1,287	91,000	.....			
1859	2,877,119	21.31	4,071,644	2,330,000	43.0	31.10	45,559	335,017	1 to 9.9	122,948	5.511	18.10	18.10	83.1	10.5	1,301	100,300	30.06			
1860	4,703,525	32.93	5,199,251	2,880,000	43.0	31.10	51,687	420,890	1 to 9.9	131,102	6.08	18.10	18.10	90.3	10.5	1,317	100,300	30.06			
1861	4,841,533	2.93	5,337,278	3,060,000	43.9	2.09	50,800	399,803	1 to 9.9	131,102	6.08	18.10	18.10	90.3	10.5	1,317	100,300	30.06			
1862	6,074,739	25.47	6,571,960	3,060,000	43.9	2.09	57,969	490,657	1 to 9.9	150,993	0.41	18.10	18.10	104.9	10.5	1,317	100,300	30.06			
1863	6,404,298	5.35	6,901,519	3,240,000	40.8	7.30	55,461	573,310	1 to 9.9	150,993	0.41	18.10	18.10	104.9	10.5	1,317	100,300	30.06			
1864	6,913,259	8.00	7,410,480	3,420,000	40.8	7.30	54,396	617,199	1 to 9.9	150,993	0.41	18.10	18.10	104.9	10.5	1,317	100,300	30.06			
1865	7,610,459	10.08	8,107,680	3,600,000	43.3	6.12	57,040	667,303	1 to 9.9	150,993	0.41	18.10	18.10	104.9	10.5	1,317	100,300	30.06			
1866	8,081,536	14.07	8,578,757	3,780,000	43.3	6.12	57,040	714,416	1 to 9.9	150,993	0.41	18.10	18.10	104.9	10.5	1,317	100,300	30.06			
1867	11,062,273	33.18	11,559,494	4,140,000	58.4	34.87	66,145	1,144,416	1 to 9.9	150,993	0.41	18.10	18.10	104.9	10.5	1,317	100,300	30.06			
1868	14,734,999	37.35	15,232,220	4,320,000	72.8	34.65	70,589	1,382,460	1 to 9.9	150,993	0.41	18.10	18.10	104.9	10.5	1,317	100,300	30.06			
1869	18,033,278	26.54	18,530,500	4,500,000	72.8	34.65	79,890	1,617,475	1 to 9.9	150,993	0.41	18.10	18.10	104.9	10.5	1,317	100,300	30.06			
1870	21,706,290	30.86	22,203,512	4,680,000	72.8	34.65	81,508	1,842,475	1 to 9.9	150,993	0.41	18.10	18.10	104.9	10.5	1,317	100,300	30.06			
1871	25,464,877	7.80	25,962,100	4,860,000	72.8	34.65	85,005	2,072,475	1 to 9.9	150,993	0.41	18.10	18.10	104.9	10.5	1,317	100,300	30.06			
1872	27,536,819	17.35	28,034,042	5,040,000	74.5	2.33	88,005	2,302,475	1 to 9.9	150,993	0.41	18.10	18.10	104.9	10.5	1,317	100,300	30.06			
1873	32,117,312	16.63	32,614,535	5,220,000	90.3	29.40	91,387	2,532,475	1 to 9.9	150,993	0.41	18.10	18.10	104.9	10.5	1,317	100,300	30.06			
1874	35,000,002	18.60	35,497,225	5,400,000	90.3	29.40	98,579	2,762,475	1 to 9.9	150,993	0.41	18.10	18.10	104.9	10.5	1,317	100,300	30.06			
1875	39,844,556	4.60	40,341,779	5,580,000	103.0	7.00	100,700	3,222,475	1 to 9.9	150,993	0.41	18.10	18.10	104.9	10.5	1,317	100,300	30.06			
1876	41,931,481	5.23	42,428,704	5,760,000	122.7	19.12	122,878	3,452,475	1 to 9.9	150,993	0.41	18.10	18.10	104.9	10.5	1,317	100,300	30.06			
1877	52,183,892	24.45	52,681,115	5,940,000	122.7	19.12	122,878	3,682,475	1 to 9.9	150,993	0.41	18.10	18.10	104.9	10.5	1,317	100,300	30.06			
1878	53,000,789	2.71	53,497,992	6,120,000	122.7	19.12	122,878	3,912,475	1 to 9.9	150,993	0.41	18.10	18.10	104.9	10.5	1,317	100,300	30.06			
1879	56,322,441	5.07	56,819,664	6,300,000	118.7	15.67	127,110	3,912,475	1 to 9.9	150,993	0.41	18.10	18.10	104.9	10.5	1,317	100,300	30.06			
Average for 21 years.	.....	16.06	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....			

The following estimate for the next five years is based on the result of the past twenty-one years, as shown above.

1880	58,861,552	114.9	62,574,000	6,480,000	114.9	15.67	137,765	4,257,740	1 to 1.7	961,061	12.80	13.53	9.10	450.7	7.7	1,111	512,000	17.30
1881	61,400,663	106.4	65,089,774	6,660,000	106.4	15.67	138,345	4,460,000	1 to 1.6	1,000,000	12.80	13.53	9.10	478.4	7.7	1,111	556,350	17.30
1882	63,989,774	96.0	67,678,885	6,840,000	96.0	15.67	139,910	4,670,000	1 to 1.5	1,039,131	12.80	13.53	9.10	496.0	7.7	1,111	600,450	17.30
1883	66,478,885	96.0	70,167,996	7,020,000	96.0	15.67	141,475	4,880,000	1 to 1.5	1,078,171	12.80	13.53	9.10	513.7	7.7	1,111	644,550	17.30
1884	69,017,996	96.0	72,707,107	7,200,000	96.0	15.67	143,040	5,090,000	1 to 1.5	1,117,211	12.80	13.53	9.10	531.3	7.7	1,111	688,650	17.30

The following estimate for the next five years is based on the result of the past twenty-one years, as shown above.

*—Municipal year changed from April 1st to January 1st. The items are for nine months only.

†—A trifle over two per cent. of this quantity was used by water engines.

—Decrease. ‡—An average of 1,213,000 galls. were used by water engines.

§—Estimated.

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ASTOR, LENOX AND
TILDEN FOUNDATIONS.

TABULAR STATEMENT OF THE CONSUMPTION & WASTE OF WATER, RELATIVE PUMPING CAPACITY, POPULATION, PIPES, REVENUE, ETC.

YEAR.	WATER DISTRIBUTED DAILY IN U. S. GALLONS.										WATER RENTS.				TAPS.			PIPE.			POPULATION.		
	ACTUAL SUPPLY.	Per Cent of Increase.	Estimated at one-sixth Annual Increase.	Estimated made in 1851 based on Inhabitant.	Quantity to each Inhabitant.	Per Cent of Increase.	Average Quantity per mile of Pipe.	Capacity of Works per mile of Pipe.	Average quantity for each Tap.	Quantity for One Dollar per year.	Capacity of Works.	Proportion of Pumping Capacity to Quantity Supplied.	Amount Collected.	Per Cent. of Increase.	Number of Taps.	In Use.	Per Cent. of Increase.	Miles of Pipe in Use.	Per Cent. of Increase.	Number of Inhab. of Pipe.	Total Number.	Per Cent. of Increase.	
1858	4,991,413	.....	.....	2,340,000	32.8	.....	276,343	641	98.39	30,000,000	1 to 6.7	\$102,179	.....	4,696	4,696	.....	19.5	72.4	.....	1,287	91,000	.....	
1859	3,877,119	29.68	3,489,980	2,530,000	45.559	10.36	335,017	705	31.55	30,000,000	1 to 5.0	122,948	30.32	3,511	3,511	18.10	18.10	85.1	17.54		1,301	100,260	30.06
1860	4,703,525	21.31	4,071,644	2,700,000	51.687	13.45	419,890	740	35.46	30,000,000	1 to 4.2	131,163	14.58	6,081	6,081	15.22	17.2	91.0	4.93	4.72	1,301	100,260	30.06
1861	4,841,535	2.93	4,730,251	2,880,000	50.803	1.71	399,863	740	32.31	30,000,000	1 to 4.1	150,290	14.38	6,876	6,876	8.28	95.3	95.3			1,301	100,260	30.06
1862	6,074,739	25.47	5,541,960	3,060,000	57.940	13.96	190,657	815	40.25	30,000,000	1 to 3.2	150,290	14.78	7,450	7,450	12.91	18.5	104.9	10.07	13.17	138,186	26.47	
1863	6,400,298	5.35	6,405,020	3,240,000	55.461	4.29	173,310	701	33.53	30,000,000	1 to 3.1	190,886	26.48	8,555	8,555	17.15	12.91	115.4	10.07	13.17	138,186	26.47	
1864	6,913,359	8.00	7,543,223	3,420,000	54.396	2.09	157,109	701	30.87	30,000,000	1 to 2.9	224,346	17.47	9,855	9,855	17.15	17.1	127.3	10.31	13.17	138,186	26.47	
1865	7,610,459	10.08	8,830,427	3,690,000	53.860	0.75	141,643	667	30.11	30,000,000	1 to 2.6	252,441	13.57	11,406	11,406	15.73	14.1	141.2	10.91	13.17	138,186	26.47	
1866	8,080,459	14.07	10,367,165	3,960,000	57.040	5.82	131,406	637	30.11	30,000,000	1 to 2.3	301,134	19.28	13,624	13,624	19.23	14.5	152.2	7.80	13.16	138,186	26.47	
1867	11,562,273	33.18	11,978,329	4,140,000	66.145	15.96	114,116	701	34.70	30,000,000	1 to 2.2	337,468	19.06	16,498	16,498	21.00	17.4	174.8	14.84	13.16	138,186	26.47	
1868	14,734,969	27.35	13,974,723	4,320,000	70.580	6.71	182,166	658	34.00	30,000,000	1 to 2.0	420,656	34.65	20,915	20,915	35.77	11.7	208.6	19.33	13.16	138,186	26.47	
1869	18,032,278	20.54	16,303,878	4,500,000	77.670	10.03	158,406	616	31.05	30,000,000	1 to 1.7	476,998	19.38	22,777	22,777	33.34	8.2	229.9	15.13	13.16	138,186	26.47	
1870	21,764,360	20.80	19,021,191	4,680,000	81.508	2.85	130,175	616	30.45	30,000,000	1 to 1.6	446,905	17.42	23,313	23,313	34.74	8.2	272.4	8.51	13.16	138,186	26.47	
1871	27,536,819	27.80	25,889,954	4,860,000	94.665	8.62	122,272	648	30.58	30,000,000	1 to 1.3	543,914	21.88	28,511	28,511	17.62	8.3	287.7	8.52	13.16	138,186	26.47	
1872	32,117,313	16.33	30,304,947	5,004,000	98.287	2.14	210,262	660	35.31	30,000,000	1 to 1.3	708,894	30.32	27,095	27,095	12.90	7.7	351.4	13.06	13.16	138,186	26.47	
1873	35,990,932	18.63	33,230,104	5,254,000	98.570	2.57	191,511	738	35.94	30,000,000	1 to 1.3	705,920	30.41	25,293	25,293	7.23	7.7	386.4	10.00	1,023	395,408	7.07	
1874	39,844,256	10.60	37,112,988	5,492,000	100.150	3.44	188,488	730	37.77	30,000,000	1 to 1.5	637,190	17.79	55,293	55,293	7.23	7.7	386.4	6.10	1,023	395,408	7.07	
1875	43,931,481	9.45	41,112,988	5,732,000	102.878	2.32	177,113	730	37.77	30,000,000	1 to 1.5	637,190	17.79	55,293	55,293	7.23	7.7	386.4	6.10	1,023	395,408	7.07	
1876	53,183,862	28.45	50,358,303	6,000,000	122.878	22.02	244,800	805	37.77	30,000,000	1 to 1.5	637,190	17.79	55,293	55,293	7.23	7.7	386.4	6.10	1,023	395,408	7.07	
1877	53,000,789	2.71	50,358,303	6,000,000	122.878	22.02	244,800	805	37.77	30,000,000	1 to 1.5	637,190	17.79	55,293	55,293	7.23	7.7	386.4	6.10	1,023	395,408	7.07	
1878	53,000,789	2.71	50,358,303	6,000,000	122.878	22.02	244,800	805	37.77	30,000,000	1 to 1.5	637,190	17.79	55,293	55,293	7.23	7.7	386.4	6.10	1,023	395,408	7.07	
1879	50,322,441	5.07	47,165,590	6,000,000	122.878	22.02	244,800	805	37.77	30,000,000	1 to 1.5	637,190	17.79	55,293	55,293	7.23	7.7	386.4	6.10	1,023	395,408	7.07	
Averages for 21 years.	.....	16.06	.....	.....	.....	5.70	.....	.....	.....	.....	.....	.....	.....	12.30	.....	12.33	.....	.....	.....	.....	.....	.....	
The following estimate for the next five years is based on the result of the past twenty-one years, as shown above.																							
1880	58,891,562				114.9		225,740	887	61.24	104,000,000	1 to 1.7	961,051		66,312				7.7	460.7		1,111	512,000	17.26
1881	61,490,663				128.345		217,391	888	61.39	104,000,000	1 to 1.6	1,000,001		69,114				8.3	478.4		1,162	556,250	17.26
1882	63,990,774				138.910		209,677	889	61.53	104,000,000	1 to 1.6	1,039,131		71,918				9.0	533.7		1,210	600,450	17.26
1883	66,478,885				149.411		195,452	890	61.65	104,000,000	1 to 1.5	1,078,171		74,718				9.0	533.7		1,270	652,260	17.26
1884	69,017,996				160.0		195,727	890	61.77	104,000,000	1 to 1.5	1,117,211		77,520				9.0	533.7		1,325	704,080	17.26

The following estimate for the next five years is based on the result of the past twenty-one years, as shown above.

1880	58,861,562	.....	55,740	887	61.24	104,000,000	1 to 1.7	961,051	.....	.....	.....	.....	.....	66,312	.....	.....	7.7	460.7	.....	.....	512,060	17.26
1881	61,400,693	.....	217,291	888	61.29	104,000,000	1 to 1.6	1,000,091	.....	.....	.....	.....	.....	69,114	.....	.....	8.3	478.4	.....	.....	556,250	17.26
1882	63,939,774	.....	299,677	889	61.33	104,000,000	1 to 1.6	1,039,131	.....	.....	.....	.....	.....	71,916	.....	.....	8.3	496.0	.....	.....	600,450	17.26
1883	66,478,885	.....	292,452	890	61.37	104,000,000	1 to 1.5	1,078,171	.....	.....	.....	.....	.....	74,718	.....	.....	9.0	513.7	.....	.....	652,260	17.26
1884	69,017,996	.....	195,727	890	61.37	104,000,000	1 to 1.5	1,117,211	.....	.....	.....	.....	.....	77,520	.....	.....	9.0	531.3	.....	.....	704,080	17.26

* Municipal year changed from April 1st to January 1st. The items are for nine months only.
 †—An average of about 1,213,000 galls. were used by water engines.
 ‡—A trifle over two per cent. of this quantity was used by water engines.
 §—Estimated.

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ASTOR, LENOX AND
TILDEN FOUNDATIONS.

...CITY DODDINGTON DICES DEVENIR ETC

YEAR

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ASTOR, LENOX AND
TILDEN FOUNDATIONS.

THE OLD WATER TANKS,

Which in the early years of the works, served as reservoirs, were long since abandoned as useless for the purpose. That on the West Side was sold early in the year for the sum of \$902.83, and its site is now occupied by a school building. The iron tank of the north reservoir, the same size as the west tank, was also sold near the close of the year, for \$2,500. The stone building on which the tank rested, remains, and is used as a storehouse. The *I* beams, taken from both the north and west structures, were retained by the city and have been used in various works as occasion required.

PIPE EXTENSION.

Since last report there have been added a trifle over 13 miles of distributing pipes. The greater portion of which are 6 and 8 inches in diameter. Most of this pipe has been laid to meet local necessities, and to fill the gaps left in the general system. Among the most important lines of pipe laid during the year, is that extending from the western limits of the pipe on Ogden avenue, to Millard avenue, a distance of over two miles. The principal object of this pipe is to supply the suburb of "Lawn-dale" located at its terminus. Next in extent is a line of 12-inch pipe, extending from Dearborn avenue west, via Gæthe and other streets to Halsted street, a distance of one mile. This pipe is designed mainly as a feeder for smaller pipes, to which it is connected at intersections.

On Twenty-first street, from Blue Island avenue to Canalport avenue, a distance of about three-fourths of a mile, an 8-inch pipe was laid, in connection with a liberal number of hydrants intended principally as a fire service, being in the immediate vicinity of a number of planing mills.

The 36-inch main has been extended southwest from the corner of Adams and LaSalle streets, a distance of about half mile, to the river on Harrison street. At the time of commencing the extension of this line in August last, a cap was forced off the

end of the pipe, permitting the water to flow under a full head, filling the trench and flooding the streets for a considerable distance. The flow of water was promptly stopped, and the work progressed without further interruption. This was the only accident of the kind worth mentioning that happened during the year.

The following comprise a list of the pipes laid for the year ending December 31, 1879:

SOUTH DIVISION

ON WHAT STREET.	BETWEEN WHAT STREETS.	Length in feet.	Diam. in inches.
Calhoun place.....	Across Franklin street.....	114	6
Calumet avenue.....	Eighteenth street and southward.....	512	8
Charles street.....	Fifth avenue and west to connect.....	45	8
Congress street.....	Fifth avenue and westward.....	40	8
Couch alley.....	LaSalle street and westward.....	60	6
Couch alley.....	LaSalle street and eastward.....	60	6
Couch alley.....	Across Franklin street.....	100	6
Court place.....	Across Franklin street.....	106	6
Dale place.....	Twenty-second street and southward.....	350	6
Dashiel street.....	214 ft. south of 28th st. and southward.....	96	6
Eighteenth street.....	Prairie avenue and Calumet avenue.....	313	8
Emerald avenue.....	Twenty-eighth street and southward.....	281	6
Fifth avenue.....	Across Polk street.....	36	8
Fifth avenue.....	Blow-off connection at Harrison street.....	14	6
Fifth avenue.....	Feeder connection at Harrison street.....	18	12
Fifth avenue.....	Feeder connection at Van Buren street.....	18	8
Fifth avenue.....	Feeder connection at Jackson street.....	65	8
Fifth avenue.....	Quincy street and Harrison street.....	1,542	36
Fifth avenue.....	Van Buren street and Harrison street.....	787	8
Fourth avenue.....	Across Van Buren street.....	75	8
Fourth avenue.....	Across Taylor street.....	72	8
Fourth avenue.....	Jackson street pipe and southward.....	48	8
Franklin street.....	South Water and Madison streets.....	1,581	8
Franklin street.....	12-inch pipe on Adams st. and northwr'd.....	40	8
Haddock place.....	Franklin street and eastward.....	47	6
Harrison street.....	Fifth avenue and Franklin street.....	391	36
Harrison street.....	Sherman street and Fifth avenue.....	320	12
Jackson street.....	Clark street and State street.....	932	8
Jones street.....	Thirty-fifth street and southward.....	316	6
LaSalle street.....	Adams street and Quincy street.....	179	36
Michigan avenue.....	Across Washington street.....	120	8
Michigan avenue.....	Across River street.....	24	24
Michigan avenue.....	River street and southward.....	57	12
Polk street.....	Fifth avenue and westward.....	364	8
Quincy street.....	Fifth avenue and LaSalle street.....	407	36
Quincy street.....	Feeder connection at Fifth avenue.....	75	8
River street.....	Michigan avenue pipe and eastward.....	60	8
River street.....	Michigan avenue pipe and westward.....	56	12
Sherman street.....	Harrison street and Van Buren street.....	1,001	6
Shields avenue.....	Thirtieth street and Thirty-first street.....	539	6
State street.....	Thirty-fifth street and southward.....	228	8
Third avenue.....	Across Van Buren street.....	75	8
Third avenue.....	Jackson street pipe and southward.....	48	8
Thirty-fifth street.....	Beers street and westward.....	324	6
Thirty-third street.....	Jones street and Beers street.....	650	8
Washington street.....	Wabash avenue and Michigan avenue.....	450	8
Wentworth avenue.....	Thirty-seventh street and southward.....	420	8
	Branch pipe for hydrants.....	13,456	
		675	
	Total in South Division.....	14,131	

WEST DIVISION.

ON WHAT STREETS.	BETWEEN WHAT STREETS.	Length in feet.	Diam. in inches.
Ann st.....	Randolph street and Lake street.....	450	6
Arthur st. (west side).....	Eighteenth street and northward.....	150	4
Arthur st. (east side).....	Eighteenth street and northward.....	198	6
Arthur street.....	Connection north of viaduct.....	40	6
Ambrose street.....	Leavitt st. and 125 ft. east of Hoyne ave.....	831	4
Ashland ave.....	South from pumping works.....	280	4
Bickerdike sq. (s. side).....	Bickerdike street westward.....	160	4
Central Park ave.....	Ogden avenue pipe and southward.....	36	6
Centre avenue.....	Clayton street, south to Twenty-first st.....	181	8
Commercial street.....	Wabansia ave. and Bloomingdale road.....	592	6
Cornelia street.....	Paulina street and Samuel street.....	334	6
Division street.....	Elston avenue and eastward.....	163	6
Douglas Park ave.....	24 ft. n. of so. line, Ogden ave. & north'd.....	80	8
Eagle street.....	Desplaines street and westward.....	79	8
18th st. (south side).....	Arthur street and westward.....	230	6
18th street (n. side).....	Arthur street and westward.....	69	4
Eleventh street.....	Sholto street and Aberdeen street.....	310	6
Elston avenue.....	68 feet north of 6-inch pipe on Division street and southward.....	268	6
Evergreen avenue.....	Hoyne avenue and Leavitt street.....	592	6
Fulton street.....	Union street and east of Desplaines st.....	560	8
Girard street.....	Bloomingdale road and Clybourne place.....	592	6
Green street.....	Kinzie street pipe and northward.....	50	8
Green street.....	Kinzie street pipe and southward.....	63	6
Harrison street.....	Robey street and Ogden avenue.....	399	8
Harrison street.....	Honore street and Lincoln street.....	329	8
Hermitage avenue.....	Harrison street and Congress street.....	356	6
Jackson street.....	Lafin street and westward.....	216	6
Kinzie street.....	Peoria street and Union street.....	1,204	12
Leavitt street.....	Twenty-second street and Ambrose st.....	325	8
Le Moyne street.....	Hoyne avenue and Leavitt street.....	608	8
Lincoln street.....	Blue Island avenue and southward.....	700	6
Loomis street.....	Twelfth street and Henry street.....	1,622	8
Loomis street.....	South line 21st st. and south to connect.....	48	8
Lydia street.....	Desplaines street pipe and westward.....	100	6
Meridian street.....	Desplaines street pipe and westward.....	65	6
Millard avenue.....	Ogden avenue and Twenty-fifth street.....	2,800	8
Monroe street.....	Morgan street and eastward.....	76	16
Monroe street.....	Morgan street and Ashland avenue.....	4,014	12
Morgan street.....	Monroe street and south to connect.....	75	12
North avenue.....	McHenry street and eastward.....	600	8
Oakley avenue.....	Warren avenue and Madison street.....	388	6
Ogden avenue.....	Western avenue and eastward.....	141	6
Ogden avenue.....	Western avenue and Millard avenue.....	9,090	8
Paulina street.....	York street and Polk street.....	470	6
Peoria street.....	Kinzie street pipe and northward.....	50	8
Phillips street.....	Halsted street and westward.....	140	6
Pipe yard.....	Ashland avenue pipe and westward.....	238	4
Randolph street.....	Canal street and eastward.....	287	8
School street.....	Across Desplaines street.....	100	6
Seventeenth street.....	452 ft. east of Centre ave. and eastward.....	198	4
Sixteenth street.....	Western avenue and eastward.....	96	6
Amount carried forward.....		31,043	

WEST DIVISION—CONTINUED.

ON WHAT STREETS.	BETWEEN WHAT STREETS.	Length in feet.	Diam. in inches.
	Amount brought forward	31,043	
Twentieth street	Paulina street and eastward	372	6
Twentieth street	Wood street and Lincoln street	625	6
Twenty-first street	Blue Island avenue and Canalport ave	4,150	8
Warren avenue	Across Oakley avenue	96	6
Waldo place	Desplaines street and westward	50	6
Washington street	Across Desplaines street	186	8
Western avenue	Gresham street and Sixteenth street	3,275	8
Wilmot avenue	Robey street and Hoyne avenue	570	6
Van Buren street	Hoyne avenue and Leavitt street	660	8
Van Buren street	Ashland avenue and eastward	350	6
Van Horn street	Paulina street and Ashland avenue	636	6
		42,013	
	Branch pipe for hydrants	1,400	
	Total in West Division	43,413	

NORTH DIVISION.

ON WHAT STREETS.	BETWEEN WHAT STREETS.	Length in feet.	Diam. in inches.
Alley n. of Kinzie st.	Between Dearborn ave. and State st.	340	6
Bissell street	Centre street and south of Clay street	914	6
Bremer street	Vedder street and Clybourne avenue	150	12
Clybourne avenue	Ashland avenue and Fullerton avenue	425	6
Clybourne avenue	Bremer street and Hurlbut street	150	12
Delaware place	Dearborn avenue and State street	300	6
Division street	Stone street and eastward	200	8
Fullerton avenue	Clybourne avenue and the river	1,275	6
Fullerton avenue	Engine house supply	30	4
Fullerton avenue	Lincoln avenue east and west	144	8
Gæthe street	Sedgwick street and Dearborn avenue	2,200	12
Halsted street	Connection at Fullerton avenue	40	6
Hien alley	Clybourne avenue and Sedgwick street	842	12
Illinois street	Kingsbury street and eastward	75	8
Kingsbury street	Michigan street and Indiana street	607	12
Lake shore drive	Division street pipe and eastward	40	4
Lake shore drive	Division street and northward	46	8
Lincoln avenue	Belden avenue and Fullerton avenue	950	6
Michigan street	Connection at LaSalle street	28	12
Poe street	Krøger street and northward	450	4
Sedgwick street	Between Hien alley and Gæthe street	50	12
St. Clair street	Illinois street and northward	85	4
Vedder street	Halsted street and Bremer street	2,050	12
Vedder street	Feeder-connection at Pleasant street	7	4
Webster avenue	Dominick street and eastward	200	6
		11,598	
	Branch pipe for hydrants	425	
	Total in North Division	12,023	

RECAPITULATION.

DIVISION.	DIAMETER OF PIPES.							Totals in feet.
	4-inch.	6-inch.	8-inch.	12-inch.	16-inch.	24-inch.	36-inch.	
South		3,408	7,054	451		24	2,519	13,456
West	1,926	9,339	25,379	5,293	76			42,013
North	612	4,444	465	6,077				11,598
Totals.....	2,538	17,191	32,898	11,821	76	24	2,519	67,067

Total amount of branch pipe for hydrants..... 2,500

Grand total length of pipe laid during the year... $13\frac{227}{1006}$ miles, or ft. 69,567

The foregoing pipe is exclusive of certain pipe laid by the city at the expense of private parties, but the cost will eventually be refunded, and the pipe revert to the city.

There is also a quantity of pipe laid as branches, connecting the distributing pipes with elevator-engines, water meters, etc., some of this pipe is owned by the city, and a portion is the property of individuals.

The following comprise the list, so far as can be ascertained, of all the pipe in use in the city:

	LINEAL FEET.
24 inch Wrought Iron Syphon Pipe at 12th street. . .	258
36 " Cast Iron Main "	27,030
30 " " " " "	18
28 " " " " "	160
24 " " " " "	67,979
16 " " " " "	57,212
12 " " " " "	127,995
10 " " " " "	8,012
8 " " " " "	442,968
6 " " " " "	890,460
4 " " " " "	693,906
3 " " " " "	21,240
4 and 6 inch " " pipe for hydrant branches	2,500
Total.....	2,339,738

Total amount of pipe reported in use in 1878, 2,270,171 ft.

Total amount of new pipe laid during the

year 1879 60,071 "

Total amount laid in place of small pipe

taken up and abandoned in 1879..... 9,496 2,339,738

or $443\frac{698}{280}$ miles in use, December 31, 1879.

PIPE TAKEN UP OR ABANDONED.

The pipe taken up or abandoned during the year, and the pipe substituted therefor, are shown in the following tabulated list:

LOCATION OF PIPE.	Removed.		Re-laid.	
	Length in feet.	Diam. in inches.	Length in feet.	Diam. in inches.
Arthur street, Eighteenth street and northward.....	† 150	4	150	4
Couch alley east of Franklin street.....	100	3	100	6
Eighteenth street from Canal street to Arthur street.....	310	4	230	6
Fifth avenue from south line Van Buren street north.....	45	4	45	8
Fourth avenue crossing Van Buren street.....	72	3	75	8
Franklin st. from So. Water st. to Washington st.....	1,055	4	1,150	8
Goethe street, Wells street and Clark street.....	900	4	900	12
Green street, Kinzie street pipe and northward.....	50	6	50	8
Green street, Kinzie street pipe and southward.....	63	4	63	6
Haddock Place between South Water st. and Lake st.....	50	3	50	6
Harrison st. between Fifth avenue and Sherman st.*.....	320	4	320	12
Illinois street east of Kingsbury street.....	75	6	75	8
Kingsbury street from Indiana st. to Michigan st.....	607	4	607	12
Kinzie street between Union street and Peoria street.....	1,204	6	1,204	12
Lydia street west of Desplaines street.....	100	4	100	6
Meridian street west of Desplaines street.....	65	4	65	6
Michigan avenue north and south of Washington st.....	120	4	120	8
Monroe street from Throop to Morgan streets.....	2,000	6	2,000	12
Monroe st. from Loomis st. to east of Ashland ave.....	1,185	4	1,185	12
Peoria street from Kinzie street pipe northward.....	50	4	50	8
School street across Desplaines street.....	100	4	100	6
Third avenue crossing Van Buren street.....	75	3	75	8
Waldo Place West of Desplaines street.....	50	4	50	6
Warren avenue east and west of Oakley avenue.....	96	4	96	6
Washington street east and west of Desplaines street.....	186	4	186	8
Washington street, Wabash ave, and Michigan ave.....	450	4	450	8
	9,478		9,496	

NOTE.—The pipe marked * was abandoned as not being worth the cost of taking them up.

The pipe marked † was changed to a new line of street.

FIRE HYDRANTS.

Owing to the cold weather prevailing during the the winter of 1878 and 79, a number of the hydrants were frequently found frozen. By proper attention, however, they were kept in serviceable condition. During the fall months a large proportion of the hydrants in the city were examined, and as far as possible protected against frost by repacking with sawdust, and in other ways. With the mild weather of the past winter, but few hydrants were found affected by frost, although the usual rigid inspection and care in this important matter were not relaxed.

Nearly all the hydrants put in during the past year are fitted with four inch double nozzle, with nozzle valves. This type of hydrant is designed for the exclusive use of the Fire Department. The use of them for any other purpose should be strictly prohibited.

In determining the size, frequency and location of new hydrants, the views of the Fire Marshal has generally been consulted.

The following tabulated statement details the hydrants added:

HYDRANTS.

NUMBER PUT IN DURING 1879.

SOUTH DIVISION.

CORNER	WHERE LOCATED.	Size of Hydrants		
		4 inch Double.	2½ inch Double.	2½ inch Single.
S. E.	Adams street and Fifth avenue.....	1		
N. W.	Charles street and Fifth avenue.....	1		
N. W.	Eighteenth street and Calumet avenue.....	1		
N. E.	Fifth avenue and alley north of Adams street.....	1		
S. W.	Fifth avenue and Polk street.....	1		
S. W.	Fourth avenue and Jackson street.....	1		
N. W.	Shields avenue and Haven street.....			1
N. E.	Jackson street and Clark street.....	1		
N. E.	Jackson street and Dearborn street.....	1		
N. W.	LaSalle street and alley north of Adams street.....	1		
S. E.	Polk street and Pacific avenue.....	1		
N. W.	Quincy street and Fifth avenue.....	1		
N. W.	Sherman street and Harrison street.....	1		
N. W.	Sherman street and Polk street.....	1		
N. E.	Thirty-third street and Beers street.....			1
N. E.	Twenty-seventh street and Quarry street.....		1	
N. W.	Van Buren street and Pacific avenue.....	1		
N. W.	Van Buren street and Fourth avenue.....	1		
S. E.	Washington street and Fifth avenue.....	1		
N. W.	Wentworth avenue and Twentieth street.....	1		
S. W.	Wentworth avenue and Nineteenth street.....	1		
West	Side Calumet avenue between 18th street and 20th street.....	1		
East	Side Clark street opposite Quincy street.....	1		
West	Side Dale Place, end of pipe south of 22nd street.....			1
Lake	Avenue, at Orphan Asylum, south of 35th street.....			1
West	Side Sherman street, bet. Van Buren and Harrison sts.....	1		
West	Side Wentworth avenue, south of 18th street.....	1		
	Total for South Division.....	22	1	4
	Previously put in.....	108	258	557
	Grand Total for South Division.....	130	259	561

WEST DIVISION.

CORNER	WHERE LOCATED.	Size of Hydrants		
		4 inch Double.	2½ inch Double.	2¼ inch Single.
N. W.	Ann street and Randolph street.....	1		
S. E.	Ann street and Lake street.....	1		
N. E.	Ambrose street and Leavitt street.....		1	
N. W.	Ambrose street and Hoyne avenue.....			1
S. E.	Blue Island avenue and Centre avenue.....	1		
S. W.	Central Park avenue and Ogden avenue.....			1
S. W.	Commercial street and Bloomingdale Road.....	1		
N. W.	Eagle street and Desplaines street.....	1		
N. E.	Eighteenth street and Ashland avenue.....	1		
S. W.	Elston avenue and Division street.....	1		
N. E.	Evergreen street and Leavitt street.....		1	
N. W.	Fulton street and Desplaines street.....	1		
N. E.	Fulton street and Union street.....	1		
N. E.	Green street and Kinzie street.....	1		
N. W.	Harrison street and Winchester avenue.....	1		
N. W.	Harrison street and Honore street.....	1		
N. E.	Harrison street and Beach street.....			1
N. E.	Kinzie street and Halsted street.....	1		
N. W.	Kinzie street and alley between Union and Halsted sts.....	1		
N. E.	LeMoine street and Leavitt street.....		1	
N. W.	Loomis street and Hastings street.....	1		
N. E.	Madison street and Oakley avenue.....	1		
N. E.	Monroe street and Throop street.....	1		
N. E.	Monroe street and Ashland avenue.....	1		
S. W.	Millard avenue and Ogden avenue.....			1
N. W.	Millard avenue and Twenty-second street.....			1
N. W.	Millard avenue and Twenty-third street.....			1
N. W.	Millard avenue and Twenty-fourth street.....			1
N. W.	Millard avenue and Twenty-fifth street.....			1
S. W.	Ogden avenue and Homan avenue.....		1	
S. W.	Oakley avenue and Warren avenue.....	1		
N. W.	Ogden avenue and California avenue.....		1	
N. W.	Ogden avenue and Western avenue.....		1	
N. W.	Paulina street and Polk street.....			1
N. E.	Randolph st. and alley between Canal st. and river.....	1		
S. E.	Twelfth street and Paulina street.....			1
N. E.	Twentieth street and Lincoln street.....			1
S. W.	Taylor street and Newberry avenue.....		1	
N. W.	Twenty-first street and Loomis street.....	1		
N. W.	Twenty-first street and Throop street.....	1		
N. W.	Twenty-first street and Allport avenue.....	1		
N. E.	Twenty-first street and May street.....	1		
N. E.	Twenty-first street and Fisk street.....	1		
N. E.	Twenty-first street and Brown street.....	1		
N. W.	Washington street and West Water street.....			1
N. W.	Washington street and Desplaines street.....	1		
N. W.	Waldo Place and Desplaines street.....	1		
S. E.	Western avenue and Fourteenth street.....			1
Amount carried forward.....		28	7	13

WEST DIVISION—CONTINUED.

CORNER	WHERE LOCATED.	Size of Hydrants		
		4 inch Double.	2½ inch Double.	2½ inch Single.
	Amount brought forward	28	7	13
N. E.	Western avenue and Twelfth street		1	
North	Side Bunker street between Halsted and Desplaines sts.			1
West	Side Brown street between Twelfth street and Maxwell st.			1
West	Side Halsted street opposite Fifteenth street	1		
West	Side Morgan street between Twelfth and Maxwell street	1		
North	Side Twentieth street between Paulina and Ashland av.			1
North	Side Twenty-first st. between Morgan st. and Brown st.	1		
North	Side Washington street 500 feet west of Falls street.	1		
	Total for the West Division	32	8	16
	Previously put in	88	398	1051
	Grand Total for West Division	120	406	1067

NORTH DIVISION.

CORNER	WHERE LOCATED.	Size of Hydrants.		
		4 inch Double.	2½ inch Double.	2½ inch Single.
S. W.	Bissell street and Clay street			1
S. E.	Clark street and Goethe street	1		
S. W.	Fullerton avenue and Clybourne avenue		1	
N. E.	Goethe street and Sedgwick street	1		
S. E.	Goethe street and Wells street	1		
N. W.	Illinois street and Kingsbury street	1		
S. E.	LaSalle street and Goethe street	1		
N. W.	Lake shore drive and Division street		1	
S. E.	Poe street and Krøger street			1
N. W.	Poe street and Clyde street			1
S. E.	Vedder street and Halsted street	1		
S. E.	Vedder street and Larrabee street	1		
West	Side Bissell street between Centre avenue and Clay st.			1
	Fullerton avenue Engine House			1
North	Side Vedder st. between Larrabee st. and Bremer st.	1		
North	Side Vedder street west of Penn street	1		
North	Side Waubansia av. between McHenry st. and the river		1	
	Total for North side	9	3	5
	Previously put in	60	167	443
	Grand Total for North Division	69	170	448

During the year 285 hydrants were repaired by renewing, and 240 received minor repairs.

RECAPITULATION.

DIVISION.	SIZE OF HYDRANTS.			TOTAL.
	4 inch Double.	3½ inch Double.	3¼ inch Single.	
North	69	170	448	687
South	130	259	561	950
West	120	406	1,067	1,593
Grand Total in city				3,230

STOP VALVES.
NUMBER PUT IN DURING 1879.
SOUTH DIVISION.

LINE OF PIPE.	LOCATION.	SIZE OF VALVES.						
		4"	6"	8"	12"	16"	24"	36"
Adams street....	East line Fifth avenue.....				1			
Arthur street....	North of Eighteenth st. Viaduct..		2					
Bushnell street....	West line Stewart avenue.....	1						
Calhoun Place....	East line Franklin street.....		1					
Calhoun Place....	West line Franklin street.....		1					
Charles street....	West line Fifth avenue Feeder..			2				
Couch Place....	West line LaSalle street.....		1					
Couch Place....	East line LaSalle street.....		1					
Couch Place....	West line Franklin street.....		1					
Couch Place....	East line Franklin street.....		1					
Court Place....	West line Franklin street.....		1					
Court Place....	East line Franklin street.....		1					
Eighteenth street	East of State street Blow-off....		1					
Eighteenth street	East of Prairie avenue.....			1				
Franklin street..	South line South Water street...			1				
Franklin street..	11 feet So. of North line Adams st.			1				
Franklin street..	North line of Lake street.....			1				
Franklin street..	South line of Lake street.....			1				
Franklin street..	North line of Madison street....			1				
Franklin street..	South line of Washington street..			1				
Fifth Avenue....	South line Van Buren street....			1				
Fifth Avenue....	South line Polk street.....			1				
Fifth Avenue....	Harrison street Feeder.....				2			
Fifth Avenue....	Harrison street Blow-off.....		1					
Fifth Avenue....	South line Harrison street.....			1				
Fourth Avenue..	South line Taylor street.....			1				
Fourth Avenue..	South line Taylor street, Blow-off	1						
Fourth Avenue..	South line Van Buren street....			1				
Fourth Avenue..	South line VanBuren st., Blow-off	1						
Haddock Place..	South line Franklin street.....		1					
Jackson street..	East line Clark street.....			1				
Jackson street..	Fifth avenue Feeder connection..			2				
Jackson street..	Fifth avenue Blow-off.....			1				
Jackson street..	Dearborn street Blow-off.....	1						
Lake street....	East line Franklin street.....			1				
Lake street....	East line Market street.....			1				
Michigan avenue	North of South line River street..				1			
Michigan avenue	South line of River street.....		1					
Michigan avenue	North line of Washington street..			1				
Michigan avenue	South line of Washington street..			1				
Polk street....	West line Fifth avenue.....			1				
Quincy street...	Fifth avenue Feeder.....			2				
River street....	East line Wabash avenue.....				1			
River street....	East line Michigan avenue.....			1				
Sherman street..	South line Polk street.....			1				
Sherman street..	South line Harrison street.....		1					
Sherman street..	South line Van Buren street.....		1					
Sherman street..	Polk street Blow-off.....	1						
Carried forward.....		5	16	27	5			

SOUTH DIVISION—CONTINUED.

LINE OF PIPE.	LOCATION.	SIZE OF VALVES.						
		4"	6"	8"	12"	16"	24"	36"
	Amount brought forward.....	5	16	27	5			
Third avenue ---	South line Van Buren street.....			1				
Third avenue ---	South line Taylor street.....				1			
Taylor street....	West line State street Blow-off....	1						
Taylor street....	West line State street.....			1				
Twenty-sixth st..	West line Stewart avenue.....			1				
Twenty-third st..	West line Stewart avenue.....	1						
Twenty-fourth st.	West line Stewart avenue....		1					
Van Buren street.	Fifth avenue Feeder connection..			2				
Washington st...	East line Market street.....			1				
Washington st...	East line Market street.....	1						
Washington st...	East line Wabash avenue.....			1				
Washington st...	West line Michigan avenue.....			1				
	Total for the South Division..	8	17	35	6			
	Previously put in	125	314	258	44	10	11	3
	Grand Total for South Division	133	331	293	50	10	11	3

WEST DIVISION.

LINE OF PIPE.	LOCATION.	SIZE OF VALVES.						
		4"	6"	8"	12"	16"	24"	36"
Adams street	West line Loomis street		1					
Adams street	West line Centre avenue		1					
Ann street	North line Randolph street		1					
Ann street	South line Lake street		1					
Ashland avenue	Near Pumping Works	1						
Ashland avenue	Monroe street Blow-off		1					
Bickerdike sq'r.	West line Bickerdike street	1						
Cornelia street	West line Paulina street		1					
Eagle street	West line Desplaines street			1				
Eagle street	West line Desplaines street	1						
Elston avenue	North line Division street		1					
Elston avenue	South line Division street		1					
Fulton street	West line Union street			1				
Fulton street	East line Union street			1				
Fulton street	East line Desplaines street			1				
Fulton street	West line Desplaines street			1				
Green street	South line Kinzie street		1					
Green street	North line Kinzie street			1				
Girard street	South line Clybourne Place		1					
Halsted street	North line Erie street		1					
Halsted street	South line Superior street		1					
Kinzie street	West line Peoria street				1			
Kinzie street	West line Union street				1			
Kinzie street	West line Halsted street				1			
Loomis street	South line Fourteenth street			1				
Lydia street	West line Desplaines street		1					
Leavitt street	South line Twenty-second street			1				
Meridian street	West line Desplaines street		1					
Morgan street	South line Monroe street Blow-off		1					
Morgan street	North line Monroe street				1			
Morgan street	South line Monroe street				1			
Monroe street	East line Morgan street					1		
Monroe street	West line Morgan street				1			
Monroe street	East line Ashl'd av. on Hy'd Br'ch		1					
Monroe street	West line Loomis street				1			
Monroe street	West line Throop street Blow-off		1					
Monroe street	West of East line Ashland avenue				1			
Monroe street	Laflin street Blow-off		1					
Monroe street	West line Centre avenue				1			
May street	Twenty-first street Blow-off	1						
Millard avenue	South line Twenty-second street			1				
Millard avenue	South line Twenty-fourth street			1				
North avenue	East line McHenry street			1				
Ogden avenue	West line Western avenue			1				
Ogden avenue	West line Rockwell street			1				
Ogden avenue	West line California avenue			1				
Ogden avenue	West line Central Park avenue			1				
Ogden avenue	West line Kedzie avenue			1				
Ogden avenue	West line Homan avenue			1				
Oakley avenue	North line Warren avenue		1					
Phillips street	West line Halsted street		1					
Peoria street	North line Kinzie street			1				
Amount carried forward		4	20	18	9	1		

LINE OF PIPE.	LOCATION.	SIZE OF VALVES. [						
		4"	6"	8"	12"	16"	24"	30"
	Amount brought forward.....	4	20	18	9	1		
Randolph street.	East line Canal street.....			1				
Twentieth street.	West line Wood street.....		1					
Twenty-first st.	West line Loomis street.....			1				
Twenty first st.	West line Centre avenue.....			1				
Twenty-first st.	West line Morgan street.....			1				
Union street.	Kinzie street Feeder.....			1				
Union street.	Kinzie st. Feeder in connection.		2					
Van Buren street.	West line Leavitt street.....			1				
Washington st.	East line Desplaines street.....			1				
Washington st.	West line Desplaines street.....			1				
Waldo Place.	West line Desplaines street.....		1					
Wilmot avenue.	West line Robey street.....		1					
Warren avenue.	West line Oakley avenue.....		1					
Western avenue.	South line Fourteenth street.....			1				
Western avenue.	South line Twelfth street.....			1				
	Total for West Division.....	4	26	28	9	1		
	Previously put in.....	340	587	413	49	30	15	2
	Grand Total for West Division.	344	613	441	58	31	15	2

NORTH DIVISION.

LINE OF PIPE.	LOCATION.	SIZE OF VALVES.						
		4"	6"	8"	12"	16"	24"	36"
Alley n. Kinzie st.	East line Dearborn avenue		1					
Bissell street....	North line Clay street		1					
Clark street	North line Gæthe street		1					
Clark street	North of south line Gæthe street		1					
Clybourne ave....	West line Ashland avenue		1					
Clybourne ave....	In connection at Hurlbut street		2					
Delaware Place..	East line state Street		1					
Fullerton avenue	Engine House supply	1						
Fullerton avenue	Engine House	1						
Fullerton avenue	West line Clybourne avenue		1					
Gæthe street....	West line Wells street				1			
Gæthe street....	West line Clark street				1			
Gæthe street....	East line Sedgwick street				1			
Gæthe street	West line LaSalle street				1			
Halsted street ...	South line Lincoln avenue		1					
Hurlbut street ...	East line Clybourne avenue				1			
Hurlbut street ..	Hien alley Feeder		1					
Illinois street...	East line Kingsbury street			1				
Kingsbury street	South line Illinois street				1			
Krøger street....	West line Sheffield avenue	1						
Larrabee street..	39 ft. n. of so. line of Vedder st.		1					
Lincoln avenue ..	North line of Belden avenue		1					
Lincoln avenue ..	South line Fullerton avenue		1					
LaSalle street ...	12 ft. so. of n. line of Gæthe st.			1				
LaSalle street....	34 ft. n. of so. line of Gæthe st.			1				
Michigan street ..	LaSalle street in connection				1			
Michigan street ..	LaSalle street Blow-off		1					
Orchard street ...	North line Belden avenue		1					
Poe street.....	East line Krøger street	1						
Sedgwick street..	12 ft. so. of n. line Gæthe street		1					
Sedgwick street..	34 ft. n. of so. line of Gæthe st.		1					
Shaughnessy st..	North line Gæthe street	1						
State street	North line Delaware Place		1					
Stone street	North line Division street		1					
Vedder street....	East line Halsted street				1			
Vedder street ...	West line Larrabee street				1			
Vedder street	East line Larrabee street				1			
Vedder street	Pleasant street Feeder		1					
Vedder street	15 ft. east of east line Pleasant st.	1						
Wells street.....	12 ft. so. of n. line Gæthe street		1					
Wells street.....	34 ft. so. of n. line Gæthe street		1					
Total for North Division		6	23	3	10			
Previously put in		163	222	198	15	8	8	1
Grand Total for North Division		169	245	201	25	8	8	1

RECAPITULATION.

DIVISION.	SIZE OF VALVES.							TOTAL.
	4 inch.	6 inch.	8 inch.	12 inch.	16 inch.	24 inch.	36 inch.	
North.....	169	245	201	25	8	8	1	657
South.....	133	331	293	50	10	11	3	831
West.....	344	613	441	58	31	15	2	1,504
Grand Total in the city.....								2,99

The above are exclusive of the large valves connected in and about the pumping works.

During the year 10 were repaired and 2 renewed.

THE EXTENSION OF PIPE DURING THE ENSUING YEAR

Contemplates the construction of a brick tunnel under the south branch of the river at Harrison street, through which the 36 inch pipe is to be extended, from its present terminus, west on Harrison street to Blue Island avenue; thence south-west to 12th street. Next year this line of pipe will be further extended to 22d street and Ashland avenue, thus connecting the North and West Pumping Works.

The design is to eventually continue a line of 36 inch pipe from the west pumping works south-east connecting with the large mains in the South Division, also due west to the city limits.

A brick tunnel will also be built under the north branch of river at Clybourne Place, affording means for connecting the 16 inch main now laid, and terminating on each side of the river.

The completion of this work will increase the supply especially in the north-western section of the city.

The extension of these great main arteries through the heart of the city, as feeders to the distributing pipes now laid and to be laid, with additional fire hydrants, will prove important for fire service and promote the general efficiency of the water supply for all purposes.

LAKE TUNNELS.

Nothing has occurred during the year, indicating any change in the conditions of the lake or land sections of the tunnels.

THE CRIB.

There is no perceptible change in this structure since date of last report. There are numerous cracks in the masonry forming the parapet which may soon need repairing. There are also a few cracks in the main walls of the structure; none of them, however, of recent origin.

Some improvements to facilitate operations at the crib are referred to in another part of this report.

WATER METERS.

Mr. Michael Ryan, Superintendent of meters, furnishes the following statement of the number of meters and water engines in use, including those added during the past year; which is as follows :

Size of Meters	$\frac{3}{8}$	$\frac{1}{2}$	1	$1\frac{1}{2}$	2	3	4	Total.
Number in use December 31, 1878	593	57	749	175	97	180	4	1,855
Number of new meters added 1879	56	30	71	15	12	27	1	212
Number in use December 31, 1879	649	87	820	190	109	207	5	2,067

Of this total the following number are private meters :

Size of Meters	$\frac{3}{8}$	$\frac{1}{2}$	1	$1\frac{1}{2}$	2	3	4	Total.
Number of Private Meters	162	24	63	10	3	24	1	287

The quantity of water measured by meters, during the year 1879, was :

North Division.....	314,894,500
South Division.....	1,304,232,750
West Division.....	693,837,500
Total Gallons	2,312,964,750

WATER ENGINES CONNECTED TO ELEVATORS, ETC.

Number in use December 31, 1878.....	147
Number added in 1879.....	26
Total.....	173

Quantity of water used, as measured by the engines, 439,314,000 gallons.

The amount derived for water measured by meters and water engines for the year 1879 is reported to be \$244,619 $\frac{55}{100}$.

It will be seen the city owns about 85 per cent. of all the meters in use, representing a large investment of money.

Until recently the city furnished meters to large consumers of water ; the present rule of the department in this regard is to attach meters ready for use at the expense of the consumer, charging only the bare cost of the machine and its attachments. All meters are attended to by the department and required repairs made, also, at the expense of those using the machine.

WATER ENGINES.

The increasing demand for water as a motor for elevators is becoming a question of no little importance in connection with the general supply. These elevators are mostly located in the business portion of the city. In some instances there are several on a single block liable to be in operation simultaneously, this must of necessity largely tax the capacity of the ordinary size street main. The 173 water elevators in use during the past year absorbed about two per cent. of the entire quantity supplied to the city. The indications are that the drain upon the water supply from this source will rapidly increase in the near future, and may involve the necessity for substituting larger distributing pipes in certain localities to meet this special demand.

These engines are so arranged as to record the quantity of water used, which it will be seen during last year amounted to an average of nearly $1\frac{1}{2}$ million gallons each business day. Most of this clean water after being used passes directly to the sewers in the vicinity, and serves in some measure to cleanse and purify them.

The supply of water should at all times be sufficiently ample to meet all reasonable demands for motive power and to encourage the establishment in our city of new industries requiring large quantities of water. But these requirements and the revenues therefrom should be held subordinate to "the primary and infinitely more important purpose of the city's water works, which is to furnish the inhabitants with an abundant supply of water for drinking and other domestic purposes," and for the protection of property against the ravages of fire.

FULLERTON AVENUE CONDUIT.

During the year, contracts were entered into for the buildings and machinery connected with this important work, and completed near the close of the year, as follows:

Contract for Engines, Boilers, etc., to Messrs. H. & F. Blandy, Zanesville, Ohio.....	\$21,900 50
Contract for Main Building, River Connections, Dock, etc., to Mr. T. E. Courtney.....	24,086 03
Total contracts executed in 1879.....	\$45,986 53
Total amount paid on account of construction of this work.....	\$563,547 60
Amount paid for account of operating.....	706 39
Total cost of the work to Dec. 31, 1879..	\$564,253 99

Exclusive of reserve held by the city on account of contracts pending.

The conduit was put in operation on the 9th of January, 1880, mainly for the purpose of testing the engines and boilers; they were kept running 10 hours per day for a short time, and subsequently for 24 hours per day, during the time the water was delivered from the lake into the river. This continued until the heavy rainfall produced a rapid current in the north branch of the river, which rendered the operation of conduit for the time being, unnecessary. The machinery will be started again as soon as circumstances seem to require it, and the water delivered in the river or the lake as may be found most advantageous.

The conduit was referred to at some length in the first annual report of the department. It may be interesting in this connection to add a brief description of its proportions and its operation so far as tested, together with a general illustration of the work.

The conduit is a brick tunnel, circular in section, 12 feet internal diameter, and 11,898 feet long, from the lake shaft to the

North Branch of the Chicago River. The bottom of the conduit from the river to Racine avenue, a length of 4,270 feet, is level, and 13 feet below datum, east of Racine avenue is a vertical reversed curve connecting the upper and lower grades of the conduit, which at this point is $27\frac{3}{8}$ feet below datum; and is continued by a series of descending grades to the lake shore shaft, where it is $54\frac{1}{2}$ feet below city datum, the grade from this point to the lake shaft, a distance of 1,000 feet, is level. The change of grade in the conduit was made for practicable reasons in construction; the west end of the excavation was open cut, and from Racine avenue eastward it was tunneled, and the grade followed the level of suitable ground for tunneling.

The upper part of the lake shaft is a cast-iron cylinder, $1\frac{1}{4}$ inches thick, 14 feet $2\frac{1}{2}$ inches outside diameter, and 24 feet long, cast in six sections of four feet each, and bolted together with internal flanges. The cylinder is lined with brick masonry, making it 12 feet internal diameter. The part of the shaft below the cylinder is also 12 feet internal diameter.

The top of the cylinder is $4\frac{1}{2}$ feet below city datum, and is located in a wooden chamber, 34x18 feet inside, with openings on the east side into the lake. These openings are fitted with gates, which are intended to be closed only when the cover is on the shaft, and to prevent it being lifted or damaged by the violence of the waves. At this end the water is shut off from the conduit by a conical cover of boiler plate, on the lower end of which is a strong flange, inclined at an angle of 45° with the horizon, and fitting on a similar flange cast on the top of the shaft, with a packing of India rubber tubing between the two flanges, making a perfectly water-tight joint. The cover projects above the water, and is provided with an opening to allow access to the shaft.

The shaft is protected from the violence of the sea by a pier of pilework securely braced together, and filled at the ends to the level of the water with loose stones or riprap, and built so as to offer the least resistance to ice and storms; on the pier and over the shaft is a frame house in which is fixed a winch for raising or lowering the cover of the shaft. The shafts at the lake

shore, Larrabee street, and Sheffield avenue, are 12 feet internal diameter, built of such a size to afford suitable facilities for working during the construction of the conduit. At each street intersection, are shafts 6 feet internal diameter, with eyes or junctions formed in them at suitable depths to afford ready means to connect with the sewerage system if it is found desirable to do so.

All shafts are carried up to the level of the street, and domed over, with openings on top for access, and covered with strong covers, and are all provided with ladder irons. At the river end where the machinery is located, the conduit is divided into two semi-circular channels, and pass one on each side of a wrought iron chamber. After passing the chamber the two channels are again united and form one channel, the same size and section as the main conduit, and is continued to the outlet on the river which is protected by a heavy masonry dock wall, in which is fixed a screen of iron rods to prevent floating debris entering the tunnel and obstructing the wheels when the current is from the river to the lake.

The water is forced through the conduit by means of two screws similar to those of an ordinary propeller, one fixed at each end of a horizontal shaft 40 feet in length, and placed in the center line of the conduit. This shaft passes through a boat-shaped iron chamber 10 feet in its greatest diameter, and secured to masonry foundations by 28 two-inch bolts. All joints in the chamber are caulked and made water-tight. The shaft and screws are operated by two single cylinder condensing engines, with cylinders 20 inches diameter and 30 inches stroke, with side valves, cut off motion and reversing gear to permit them to run either way. The engines are placed on top of the chamber at the level of the engine house floor.

The driving shaft is 8 inches diameter and made in three sections. The engines are coupled to the middle or crank sections by connecting rods 16 feet long. This section also carries the eccentrics for working the valves and is supported on pillow blocks bolted to the masonry foundations. The end sections of the shaft are connected to the middle by couplings, which have

a longitudinal play sufficient to prevent the thrust being communicated to the middle section. They are also provided with an adjustable device to prevent the thrust and wear from the screw coming upon the end post of the chamber.

The screws are four-bladed, 6 feet 7 inches diameter, with a pitch of 8 feet. The back and forward edges of the blades are projected upon a plan parallel to the axis, and parallel one to another, and the blades as foreshortened in projection are 12 inches in width, making the total area of the four blades of each screw one-half of the total area of a complete turn of the helicoid.

There are three cylindrical boilers, 16 feet long and 66 inches diameter, with forty 5-inch longitudinal tubes in each boiler. The boilers are set singly in masonry, and each boiler has 30 square feet of grate surface and 1,000 square feet of heating surface, and are connected with a brick chimney 3 feet 9 inches square inside and 100 feet high. The boilers are designed to bear a constant pressure of 80 pounds per square inch above the atmosphere, although it is not intended to work them with more than 60 pounds pressure of steam.

The engines are designed to work at a uniform rate of 100 revolutions per minute, and are required to make as many as 125 revolutions per minute without injury.

There has been no formal or scientific test made to determine the performance of the machinery, but as far as can be seen there appears to be no doubt they will fulfill all the requirements of the specifications.

The portion of the conduit surrounding the shaft chamber and at each end of the same, a total length of 64 feet, is lined with a circular timber lining, funnel-shaped at the ends. At each end the lining is 12 feet inside diameter, from thence forward it is contracted in size, and at the screws it is 6 feet 8 inches in diameter, or only 1 inch more in diameter than the screws.

In designing the machinery there was some doubt as to the best size and form for the screw, there being no precedent where

a propeller wheel is used for forcing water in a confined channel, and the lining of the screw chamber is somewhat of a temporary character, easily altered and adapted to any size and form of wheel, which from experience may be found best and most economical to perform the required work.

To afford easy access to that part of the conduit where the screws are, two circular slide gates are placed one at each end of the engine-room about 92 feet apart; the gates are 12 feet clear opening, made of boiler plate and faced with brass; in the center of each gate is a supplementary gate 36 inches diameter, to relieve the pressure from the large gate when required. The gates are operated by worm gear placed in the engine room, and when closed the portion of the conduit between the gates can be pumped dry in a short time, so that the necessary repairs or alterations can be made in the screws.

For the purpose of ascertaining the head of water against the screws, there are two wells built adjacent to each other, and each well is connected with the conduit by a 4-inch pipe, one with the conduit west of the shaft chamber and the other with the conduit east of the shaft chamber.

In the design of the machinery and conduit it was expected that with 100 revolutions of the screw a head of 4 feet would be maintained on the line of the conduit, or sufficient to deliver not less than 24,000 cubic feet of water per minute.

An experiment was made soon after the engines were completed, to test the flow of water through the conduit.

The height of water was taken on graduated rods fixed permanently in the shafts divided to .01 feet. The rods were set by water level when the gates were closed at both ends of the conduit, and then checked by instrument. The velocity of flow was measured by an electric current meter, which during each period was placed at different positions in the conduit and the velocity noted. To insure a correct reading of the meter, the shaft where this instrument was placed was closed by lagging forming a section of the tunnel, so as to eliminate, as far as possible, all

disturbances caused by eddies. In the cover was an opening just large enough to admit the meter. Careful observers were placed at each station, and the readings taken every five minutes. The time occupied by the experiment was two days. The result is given in the following :

TABLE

Showing the velocities of water in Fullerton Avenue Conduit, measured with an electric current meter at different positions in the conduit Diameter of conduit, 12 feet. Length, 8,900 feet between stations. Obstruction to flow, 16 shafts 6 feet diameter, 2 shafts 12 feet diameter, 2 bends 45 feet radius; angle, 30°.

Revolution of engines per minute.	Head against Engines.	Head on con- duit for a length of 8,900 feet.	VELOCITIES.						Cubic feet per minute.
			Location of meter above the bottom of conduit					Mean.	
			8"	1' 8"	1' 11"	2' 10"	Center.		
70	1.16	.82	1.2886	1.423	1.386	1.445	1.6306	1.394	9,451
79	1.46	.96714	-----	1.723	1.7322	1.7851	1.7582	1.6623	11,270
90	2.02	1.321	1.7	2.0512	2.1468	2.2454	2.183	2.025	13,729
99	2.58	1.525	2.0569	2.0847	2.135	2.191	2.3	2.131	14,448
103	2.83	1.6947	1.9274	2.128	2.2316	2.304	2.355	2.141	14,516
110	3.02	1.9617	1.1755	2.4678	2.4808	2.5186	2.4681	2.256	15,265

The absence of any recorded experiments, with screws for the service in which they are employed in this work, suggested the propriety of so constructing the channel of the conduit where they are located, that if found desirable, screws of different proportions could be substituted, with comparatively little trouble or expense. It is intended as soon as convenient, to make some experiments, to determine the size and form of screw, best adapted to the work.

The engines will also be tested during the ensuing year as prescribed in the contract, to determine their duty.

The annexed plans and sections illustrate the lake and river ends of the conduit.

RIVER AND DREDGING.

Mr. Francis Murphy, Assistant Engineer in charge of river work, submits the following information relative to the River and Harbor, together with some suggestions regarding improvements, as seem to be called for during the coming season:

The entire distance contemplated in last year's contract for dredging, including the main river and its branches, was $10\frac{1}{10}$ miles, divided as follows: The main river from the east end of the south pier to Lake and Kinzie street bridges, $1\frac{4}{10}$ miles; North Branch from Kinzie street bridge to Fullerton avenue, $3\frac{5}{10}$ miles; South Branch from Lake street bridge to Ashland avenue and Fuller street bridges, $4\frac{5}{10}$ miles; South Branch of South Branch from Fuller street bridge to Wahl's glue factory, $\frac{4}{10}$ miles, and the West Fork of the South Branch, from Ashland avenue bridge to Slip A, $\frac{8}{10}$ miles. The distance worked over by the dredges within these limits was 6 miles and 43 feet.

The following table shows the extent and cost of dredging during the past year:

SECTION
OVER END
WAVE CONDUIT.

THE NEW YORK
PUBLIC LIBRARY

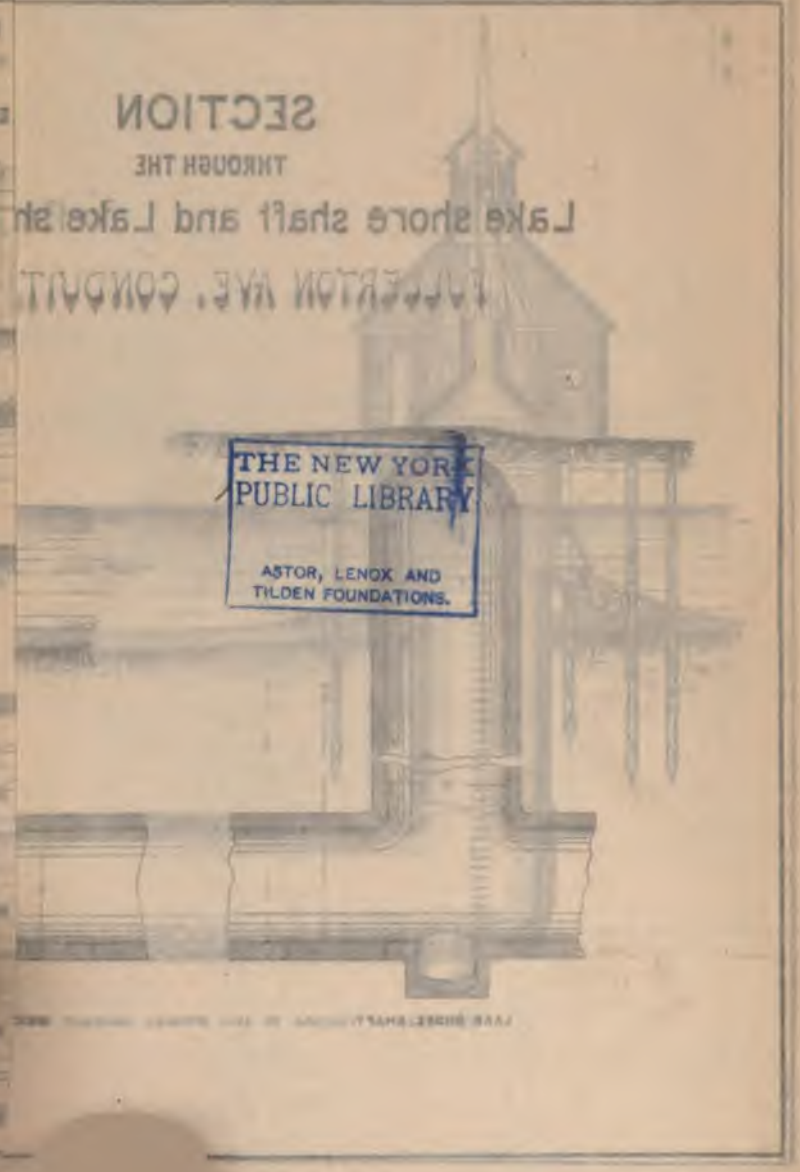
ASTOR, LENOX AND
TILDEN FOUNDATIONS

PLAN OF ENGINE ROOM

PL
O
ERT

SECTION
THROUGH THE
Lake shore shaft and Lake sh
COLLETON WVE. CONDUIT

THE NEW YORK
PUBLIC LIBRARY
ASTOR, LENOX AND
TILDEN FOUNDATIONS.



PLAN OF THE SHEDS AND STABLES OF THE NEW YORK PUBLIC LIBRARY

TABLE SHOWING THE OPERATIONS OF DREDGING DURING THE YEAR 1879.

No. of Section.	LIMITS.	Distance in Lineal feet.	Portion dredged in lineal feet.	Quantities Removed.		Cost per cubic yard.	TOTAL COST.		Difference in amount based on measurement of	
				In cubic yds measured by soundings.	In cubic yds measured by scow.		By soundings.	By Scow.	Soundings.	Scow.
1	Main River from its mouth to Lake and Kinzie streets.-----	7,759	4,662	37,449	39,104	CTS. 25	\$ 9,362.25	\$ 9,776.00	-----	\$ 413.75
2	South Branch from Lake to 12th streets.-----	6,820	1,480	9,821	9,485	30	2,946.30	2,850.65	\$ 115.65	-----
3	South Branch from 12th to 22d streets.-----	6,840	2,760	4,709	5,338	37	1,742.33	1,975.06	-----	232.73
4	South Branch from 22d Street to Ashland Avenue and Fuller street.-----	10,578	10,578	31,360	34,445	45	14,112.00	15,500.25	-----	1,388.25
5	South Branch from Ashland Avenue to Western Avenue.-----	2,500	2,315	8,432	8,423	50	4,216.00	4,211.50	4.50	-----
6	South Branch from Fuller to 33d streets.-----	7,835	6,166	23,294	23,296	35	8,152.90	8,153.60	-----	0.70
7	North Branch from Kinzie to Division sts.-----	6,398	2,150	7,167	7,208	45	3,225.15	3,243.60	-----	18.45
8	North Branch from Division street to Clybourne Place.-----	4,483	1,612	2,687	2,858	50	1,343.50	1,429.00	-----	85.50
9	North Branch from Clybourne Place to City Limits.-----									
Totals -----		53,213	31,723	124,919	130,327		\$ 45,100.43	\$ 47,119.66	\$ 120.15	\$ 2,139.38

The channel dredged out by the city last year, varied from 60 to 90 feet in width, except in the upper portion of the North Branch where it was less, and the mouth of the river where it was greater. (See table page 52.) The average depth of water obtained was 14 feet below city datum, but owing to the mobile nature of the upper portion of the deposit, the matter left on each side soon flowed into the space dredged out, and partly filled up the channel again, and this natural tendency of the material to move of itself, was greatly facilitated by the passage through it of those large flat bottomed vessels, now used so extensively upon the lakes, and also by the action of the propeller wheels.

To do the dredging properly the whole width of the river should be dredged at the same time. This is impracticable, however, unless the city should undertake to do it all.

An improvement much needed is a revision of the dock lines, with a view to the removal of the sharp bends in the river. It is with great difficulty that the largest class of vessels can pass around these bends, especially when the docks on both sides are occupied by vessels tied up. The river needs widening in many places, for the same reason. The vessels now are built very much larger and are much more numerous than formerly, and consequently require a greater amount of room.

Another improvement needed, is the building of docks where none exist at present, as far at least, as the tug boats ply, in order to protect the banks from washing, and also the repairing of those docks from behind which the filling washes out into the river.

The present improved condition of the North Branch is undoubtedly due in part, to the heavy rains and to the Fullerton avenue conduit. While the North Branch was being purified by the lake water delivered into it through the conduit, the main river and South Branch became purified by the lake water forced into them by a succession of northerly winds in the course of the past open winter. At no time during the winter was the lake frozen over in this vicinity, there was nothing to prevent

these winds from forming a head sufficient to force the water into the river and thence into the canal. Although the capacity of the canal is small, and the current very moderate, still the volume of water that it carries off daily, is very considerable. This will be better understood by giving the figures.

From repeated measurements made lately, the mean velocity of the water entering the canal was found to be 6.9 inches per second. The height of the water above city datum when these measurements were taken, was $\frac{8}{10}$ of a foot, which is about an average, and the area of the cross section of the canal was 381.1 square feet. By using these data, the water passing into the canal was found to be 219.13 cubic feet per second, making the amount carried off every 24 hours 18,932,832 cubic feet.

In connection with this subject the following tabulated statement is submitted:

NAME.	Area of sur- face in acres drain- ing into each branch.	No. sew- ers dis- charging into each branch.	Aggregate area of their terminal openings in square feet.	PRESENT CONDITION OF THE WATER IN EACH DIVISION OF THE RIVER.	RELATIVE DENSITY OF POPU- LATION ON EACH OF THE GIVEN AREAS.
North Branch.....	1988.98	19	299.53	{ From rolling mill north comparatively pure, from same point south highly discolored, with little odor..... }	$\frac{3}{8}$ densely, $\frac{1}{8}$ sparsely settled.
Main River.....	808.08	16	122.47	{ Nearly free from deleterious matter, little or no odor..... }	Densely settled.
South Branch.....	3364.09	48	460.05	Highly discolored with very little odor.....	$\frac{3}{8}$ dens'ly, $\frac{1}{8}$ spar'ly settl'd.
West Fork of S. B...	581.73	2	56.94	No perceptible odor, water nearly pure.....	Sparsely settled.
South Fork of S. B..	354.45	5	52.82	{ Extremely foul, water charged with decom- posing animal and vegetable matter, odor very offensive..... }	Sparsely settled.
	7097.33	90	921.81		

To get the whole area covered by the sewer system of the city, there must be added to the above the area of that portion of the South Division, which drains directly into the lake, and which contains 1,270.43 acres. This swells the total amount to 8,368 acres or a little more than 13 square miles, which is something over 36 per cent. of the area embraced within the present city limits.

OUTER HARBOR.

We are indebted to the courtesy of Captain G. J. Lydecker, Engineer U. S. A., now in charge of the government improvements of this harbor, for the following :

MEMORANDUM OF WORK DONE BY THE UNITED STATES FOR IMPROVING THE HARBOR AT CHICAGO, ILL., FROM JANUARY 1, 1879, TO JANUARY 1, 1880:

The new (southerly) breakwater for protecting the outer basin against southeast seas, was commenced in the spring of 1879, and up to the close of the working season, 2,300 lineal feet had been completed. This work commenced at about 750 feet south of the end of the easterly breakwater, and extends south 250 feet; thence in a southwest direction 2,050 feet, for a distance of 300 feet from the point of beginning. The breakwater consists of cribs 30 feet wide and the balance is of cribs 16 feet wide, all filled with stone, and resting on a bearing pile foundation, the level of which is $14\frac{1}{2}$ feet below low water.

There remains a length of 700 feet to complete this breakwater, and this will be accomplished by or before the 1st of June, 1880.

Its cost completed will be about \$35 per lineal foot. The operations for the coming fiscal year cannot be determined upon until the passage of the appropriation bill now before Congress; but the principal work in contemplation, in addition to dredging the basin within the breakwater, is the construction of an

NAME.	Area of surface in acres draining into each branch.	No. sewers discharging into each branch.	Aggregate area of their terminal openings in square feet.	PRESENT CONDITION OF THE WATER IN EACH DIVISION OF THE RIVER.	RELATIVE DENSITY OF POPULATION ON EACH OF THE GIVEN AREAS.
North Branch.....	1988.98	19	239.53	{ From rolling mill north comparatively pure, from same point south highly discolored, with little odor..... }	$\frac{3}{8}$ densely, $\frac{1}{8}$ sparsely settled.
Main River.....	808.08	16	122.47	{ Nearly free from deleterious matter, little or no odor..... }	Densely settled.
South Branch.....	3364.09	48	460.05	Highly discolored with very little odor.....	$\frac{3}{8}$ densely, $\frac{1}{8}$ sparsely settled.
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Main River.....	808.08	16	132.47	{ Nearly free from deleterious matter, little or no odor..... }	Densely settled.
South Branch.....	3364.09	48	460.05	Highly discolored with very little odor.....	$\frac{2}{3}$ dens'y, $\frac{1}{3}$ spar'y settl'd.
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NAME.	Area of surface in acres draining into each branch.	No. sewers discharging into each branch.	Aggregate area of their terminal openings in square feet.	PRESENT CONDITION OF THE WATER IN EACH DIVISION OF THE RIVER.	RELATIVE DENSITY OF POPULATION ON EACH OF THE GIVEN AREAS.
North Branch.....	1988.98	19	229.53	{ From rolling mill north comparatively pure, from same point south highly discolored, with little odor..... }	$\frac{1}{2}$ densely, $\frac{1}{4}$ sparsely settled.
Main River.....	808.08	16	122.47	{ Nearly free from deleterious matter, little or no odor..... }	Densely settled.
South Branch.....	3364.09	48	460.05	Highly discolored with very little odor.....	$\frac{1}{8}$ densely, $\frac{1}{4}$ sparsely settled.
West Fork of S. B..	581.73	2	56.94	No perceptible odor, water nearly pure.....	Sparsely settled.
South Fork of S. B..	354.45	5	52.82	{ Extremely foul, water charged with decom- posing animal and vegetable matter, odor very offensive..... }	Sparsely settled.
	7097.33	90	931.81		

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outer breakwater, located to the northward and eastward of the north pier, to cover an anchorage in deep water, which shall at all times be readily accessible from the inner harbor.

SEWERAGE.

The following tabulated statements compiled from the department records, show the extent of the work of construction and maintenance of the public sewers and their attachments; also, the expenditures for the same, together with a report of private drains:

TOTAL LENGTH IN FEET OF SEWERS, DECEMBER 31, 1879.

Diameter in Feet.	SOUTH DIV.		WEST DIV.		NORTH DIV.		TOTAL, THREE DIVISIONS.		
	Previous to Dec. 31, 1878.	Year ending Dec. 31, 1879.	Previous to Dec. 31, 1878.	Year ending Dec. 31, 1879.	Previous to Dec. 31, 1878.	Year ending Dec. 31, 1879.	Previous to Dec. 31, 1878.	Year ending Dec. 31, 1879.	Totals to Dec. 31, 1879.
6½			1,380				1,380		1,380
6	2,408		4,237		3,805		10,540		10,540
5½			5,460				5,460		5,460
5	9,118	44	47,355		13,756		70,229	44	70,273
4½	6,244	1,259	55,638	373	9,635		71,517	1,732	73,249
4	8,748	1,636	64,568	1,632	11,892		85,208	3,268	88,476
3½	2,298	331	21,185	2,003	3,735		27,218	2,334	29,552
3¼			665				665		665
3	33,324	366	26,091	667	12,139		71,554	1,033	72,587
2½	71,040	3,047	15,798	1,343	28,115	560	114,953	4,950	119,903
2¼	6,359						6,359		6,359
2	116,544	9,495	273,395	11,844	110,314	6,576	500,253	27,915	528,168
1½	5,545	7,923	17,242	27,143	4,002	6,382	26,789	41,448	68,237
1	173,021	10,505	265,802	35,232	125,232	16,920	564,055	62,637	626,712
Totals.	434,649	34,706	798,816	80,237	322,715	30,438	1,556,180	145,381	1,701,561
	469,355		879,053		353,153		294 8840	2621	322 1401
	27.58 per cent.		51.66 per cent.		20.76 per cent.		Miles.	Miles.	Miles.

CATCH BASINS AND MAN HOLES, DECEMBER 31, 1879.

DIVISIONS.	Built during the year ending December 31, 1879.				Built previous to Dec. 31, 1878.	Total Built to Dec. 31, 1879.
	South.	West.	North.	Total.		
Catch Basins.....	264	464	92	820	8,971	9,791
Man Holes	253	554	236	1,043	10,356	11,399

SUMMARY OF EXPENSES ATTENDING THE CONSTRUCTION OF
SEWERS FOR THE YEAR ENDING DEC. 31, 1879.

CHARACTER OF WORK.		Length in Feet.	Average Cost.	Total Cost.
Brick Sewers	4½	1,732	\$3 36	\$ 5,819 52
do do	4	3,268	3 15	10,294 20
do do	3½	2,334	3 18	7,424 06
do do	3	1,033	2 47	2,556 06
do do	2½	4,950	2 44	12,073 43
do do	2	27,915	1 41	39,183 63
Vitrified Clay Sewer Pipe	1½	41,448	1 04	43,321 11
do do do do	1	62,657	1 01	63,192 34
Catch Basins, No. of		820	39 18	32,127 18
Twenty-second street outlet.....				4,415 47
Morgan street outlet.....				1,036 02
Augusta street outlet.....				1,216 91
Twelfth street outlet.....				2,785 78
Advances repaid during the year ending December 31st, 1879.....				6,639 33
Totals and averages.....		145,337	\$1 28	\$232,085 07
For material on hand, less amount due on same..		\$10,694 04		
For material used in maintenance, and by Water Department, transfers of which have not been made		21,948 36		\$32,642 40
Total Expenditure for the year ending December 31st, 1879, as shown by the Ledger				\$264,727 47
Source fr'm which sew- ers have been for.	Unexpected balance of 1878	\$49,522 15		
	Appropriation of 1879.....	250,000 00		
	Advances made by private parties	3,393 30		
	Amount paid by House Drains.....	8,812 14		
	Unexpended balance of 1879, and transferred to Appropriation of 1880.....			47,000 12
				\$311,727 59
				\$311,727 59

SUMMARY OF EXPENSES ATTENDING THE CONSTRUCTION OF
SEWERS SINCE THE BEGINNING OF THE SYSTEM IN 1855,
INCLUDING THE YEAR ENDING DEC. 31, 1879.

CHARACTER OF WORK.	Diam. in feet.	Total to December 31st, 1879.		
		Length in ft.	Av. Cost.	Total Cost.
Brick Sewers.....	6½	1,380	\$ 5 55	\$ 7,664 16
do do.....	6	10,540	11 87	125,114 65
do do.....	5½	5,490	6 28	34,501 50
do do.....	5	70,229	6 55	461,302 95
do do.....	4½	73,249	6 48	473,665 00
do do.....	4	88,476	6 06	535,621 75
do do.....	3½	29,552	5 09	149,901 40
do do.....	3¼	665	3 08	2,040 47
do do.....	3	72,587	4 33	313,985 98
do do.....	2½	119,903	3 37	403,596 51
do do.....	2¼	6,359	2 30	14,637 80
do do.....	2	528,168	2 30	1,211,164 26
Vitrified Clay Sewer Pipe.....	1½	68,237	1 33	87,007 52
do do do do.....	1	636,712	1 41	876,721 94
Catch Basins, No. of.....	---	9,789	58 10	567,875 45
Twenty-second street outlet.....	---	---	---	4,415 47
Morgan street outlet.....	---	---	---	1,036 02
Augusta street outlet.....	---	---	---	1,216 91
Twelfth street outlet.....	---	---	---	2,785 78
Advances repaid during the year ending December 31st, 1879.....	---	---	---	6,639 33
Totals and averages.....	---	1,701,517	\$3 10	\$5,280,894 85
The total cost of Sewers and adjuncts to date is. Of this amount there has been appropriated from taxation.....	---	\$5,130,988 09	---	\$5,280,894 85
From revenue of private drains and other miscel- laneous sources.....	---	159,906 76	---	---
	---	\$5,280,894 85	---	\$5,280,894 85
The total expenditures as above are divided as follows:	---	---	---	---
Sewers, etc., South Division.....	---	---	---	1,465,463 08
do West Division.....	---	---	---	2,733,685 35
do North Division.....	---	---	---	1,081,746 42
	---	---	---	\$5,280,894 85

**DETAIL OF THE MAINTENANCE OF SEWERS FOR THE YEAR
ENDING DECEMBER 31, 1879.**

				DETAIL.		TOTALS.	
				No.	Cost.	No.	Cost.
CLEANING.	Sewers, feet, Cleaned by.	Flushing.	South Div'n.	165,415	\$2,091 37	633,794	\$6,887 21
			West "	354,840	3,314 72		
			North "	113,539	1,481 12		
		Chain Machine and Scrapers.	South Div'n.	38,320	2,392 50	87,840	5,465 48
			West "	30,460	1,644 68		
			North "	19,060	1,428 30		
	Catch Basins.	South Div'n.	2,385	5,038 42	7,636	16,930 98	
		West "	3,375	4,853 73			
		North "	1,976	4,038 83			
	REPAIRS.	Sewers.	West Div.	1¼, 19th, East of Lincoln st.	75	11 25	75	11 25
North Div.				1. Dayton, South of Clay st.	109	166 91	
			1. Wing cor. Sedgwick and Menomonee st.	14	29 01		
			1. Tell ct.	6	14 30		
Catch Basins and Man Holes.			South Div'n.	48	352 34	112	741 57
		West "	62	345 72			
		North "	2	43 51			
Iron Man Hole and Catch Basin Covers substi- tuted for wooden cov- ers.		South Div'n.	186	1,396 90	998	7,332 46	
		West "	306	2,246 86			
		North "	156	1,146 60			
		Where stre'ts were paved.	350	2,572 10			
Repairs of Wooden Man Hole and Catch Basin Covers.		South Div'n.	552	1,096 70	1,598	3,134 58	
		West "	897	1,754 08			
		North "	149	283 80			
Sewerage Ventilation.		Labor putting Iron Ven- tilating Covers on Man Holes and Catch Basins.	South Div'n.	C. B.	M's.	1,136	3,568 71
	West "			28	516		
	North "			271			
	Man Holes to grade.			337			
	Street Intersections.	Catch Basins to grade.		347		684	5,243 11
Total expenditure for maintenance					\$49,525 57		

SUMMARY OF THE MAINTENANCE OF SEWERS SINCE THE
ORGANIZATION OF THE BOARD OF PUBLIC WORKS
IN 1861, INCLUDING THE YEAR ENDING
DECEMBER 31, 1879.

			TOTALS AND AVERAGES.			
			For 19 yrs. ending Dec. 31st, 1879.	For the yr. ending Dec. 31st, 1879.		
In use at the beginning of the year.			Miles of Sewers..... Number of Man Holes..... Number of Catch Basins.....	2,829 1-5 91,349 73,347	294 3-5 1,043 820	
REPAIRS.	Sewers.	Total cost of repairs..... Annual average cost per mile, based upon the total number of miles in use at the beginning of the year..... Number of feet repaired.....	\$35,238 99 12 45 13,970	\$221 47 0 75 204		
		C. Basins and Man Holes.	Total cost of repairs..... Annual average cost based upon the total number in use at the beginning of the year..... Number repaired.....	\$47,192 11 0 26 5,090	\$741 57 0 04 112	
			Covers.	Total cost of repairs..... Annual average cost based upon the total number in use at the beginning of the year..... Number repaired and replaced..... Cost of Setting Iron Man Hole and Catch Basin Covers, substituted for wooden covers..... Number substituted and set.....	\$66,054 01 0 36 27,152 \$7,332 46 998	\$3,134 58 0 16 1,598 \$7,332 46 998
	Sewers.			Total cost of cleaning..... Annual cost per mile based upon the total miles in use at the beginning of the year..... Number of miles cleaned.....	\$267,891 64 94 69 1,370 3-5	\$12,352 69 42 01 136 3-5
		Catch Basins.		Total cost of cleaning..... Annual average cost per basin based upon the number in use at the beginning of the year..... Number of basins cleaned.....	\$155,742 83 1 91 66,277	\$16,930 98 1 89 7,636
				Sewerage Ventilation.	Cost of labor for putting Iron Covers on Man Holes and Catch Basins for the purpose of ventilating the sewers..... Number.....	\$3,568 71 1,136	$3,568 71 1,136
	Cost of raising Man Holes and Catch Basins to grade where streets are to be filled and paved.....			\$171,197 59	\$5,243 11	
	Total Cost for maintenance.....			\$754,218 34	\$49,525 57	

SOUTH DIVISION.—Continued.

LOCATION.		LENGTH IN FEET OF SEWERS BUILT.									
ON WHAT STREET.	FROM.	TO.	5	4½	4	3½	3	2½	2	1½	1
Thirty-first street.....	Wallace street.....	Stewart avenue.....	.....	1,329	661	.....	.....	.....	.....	.....	.....
Thirty-first street.....	Stewart avenue.....	Portland avenue.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Thirty-first street.....	Portland avenue.....	Fifth avenue.....	.....	.....	331	.....	.....	.....	.....	.....	.....
Thirty-first street.....	Fifth avenue.....	Wentworth avenue.....	.....	.....	332	.....	.....	.....	.....	.....	.....
Thirty-first street.....	Wentworth avenue.....	LaSalle street.....	.....	.....	.....	.....	.....	392	.....	.....	.....
Thirty-first street.....	LaSalle street.....	Eastward.....	.....	.....	.....	.....	.....	.....	.....	.....	121
Thirty-eighth street.....	Vincennes avenue.....	Vincennes place.....	.....	.....	.....	.....	.....	.....	.....	246	408
Thirty-eighth street.....	Vincennes place.....	287 E. of Langley avenue.....	.....	.....	.....	.....	.....	.....	.....	263	621
Thirty-eighth street.....	287 E. of Langley avenue.....	Cottage Grove avenue.....	.....	.....	.....	.....	.....	.....	.....	.....	230
Vincennes place.....	Egan avenue.....	Thirty-eighth street.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Wentworth avenue.....	Twenty-ninth street.....	Swift Place.....	.....	.....	.....	.....	.....	.....	.....	492	.....
Wentworth avenue.....	Swift place.....	Thirtieth street.....	.....	.....	.....	.....	.....	.....	.....	577	.....
Wentworth avenue.....	Thirtieth street.....	Thirty-first street.....	.....	.....	.....	.....	.....	.....	698	.....	.....
Wentworth avenue.....	Thirty-first street.....	Thirty-second street.....	.....	.....	.....	.....	.....	.....	.....	.....	663
Wentworth avenue.....	Thirty-second street.....	Thirty-third street.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Wabash avenue.....	Thirty-seventh street.....	Thirty-seventh court.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Rhodes avenue.....	M. H. in 35th street.....	WING SEWERS. 6 ft. N. N. line 35th street.....	.....	.....	.....	34	.....	.....	.....	.....	.....
Stanton avenue.....	Thirty-fifth street.....	Thirty-fifth street.....	.....	.....	.....	.....	.....	.....	40	.....	.....
Twelfth street.....	Outlet.....	Outlet.....	44	.....	.....	.....	.....	.....	.....	.....	.....
Twenty-second street.....	Outlet.....	.....	.....	.....	.....	.....	.....	10	.....	.....	.....
Thirty-first street.....	M. H. in Wallace street.....	26 feet West.....	.....	.....	26	.....	.....	.....	.....	.....	.....
Thirty-eighth street.....	M. H. in Vincennes avenue.....	East.....	.....	.....	.....	.....	.....	.....	.....	39	.....
Wallace street.....	E. line Wallace street.....	N. line 31st street.....	.....	30	.....	.....	.....	.....	.....	.....	.....
			44	1,359	1,636	331	366	3,047	9,495	7,923	10,505

LENGTH IN FEET OF SEWERS BUILT.

[illegible]

WEST DIVISION.—Continued.

[illegible]

WEST DIVISION.—Continued.

LOCATION.			LENGTH IN FEET OF SEWERS BUILT.								
ON WHAT STREET.	FROM.	TO.	5	4½	4	3½	3	2½	2	1½	1
Winthrop place	Taylor street	Polk street									802
Wood street	Erle street	Ohio street							303		
Wood street	Brigham street	North avenue								1,194	
Wood street	Congress street	Harrison street									314
Wood street	Van Horn street	Eighteenth street			296						
				373	1,632	2,003	667	1,343	11,844	27,143	35,332

NORTH DIVISION.—Continued.

LOCATION.			LENGTH IN FEET OF SEWERS BUILT.								
ON WHAT STREET.	FROM.	TO.	5	4½	4	3½	3	2½	2	1½	1
Orchard street.....	Sophia street.....	Webster avenue.....								645	
Orchard street.....	Centre street.....	South.....								780	
Perry street.....	Clybourne avenue.....	Belden avenue.....							337		
Perry street.....	Bolden avenue.....	Fullerton avenue.....								606	
Sheffield avenue.....	N. line Kroger street.....	E. line Sheffield av. at Clay st..							300		
Southport avenue.....	Webster avenue.....	Belden avenue.....							600		
Sophia street.....	Fremont street.....	Bissell street.....								327	
Sophia street.....	Fremont street.....	Dayton street.....								327	
Sophia street.....	Dayton street.....	175 E. of Halsted street.....								471	
Tell court.....	Wells street.....	Franklin street.....								402	
Tell court.....	Sedgwick street.....	Franklin street.....								454	
Dayton street.....	M. H. in Clay street.....	WING SEWERS.									22
Fremont street.....	M. H. in Clay street.....	North.....									22
Bissell street.....	M. H. in Clay street.....	North.....									22
Sophia street.....	M. H. in Bissell street.....	W. line Bissell street.....									26
								560	6,576	6,382	16,910

PRIVATE DRAINS.

CHICAGO, March 1, 1880.

DEWITT C. CREGIER, Esq., *Chief Engineer*:

I herewith submit a report of the operations of this department for the year ending December 31, 1879; also, some suggestions for your consideration that I deem of vital interest to the public at large.

SUMMARY OF RECEIPTS AND EXPENDITURES FOR PRIVATE DRAINS, TOGETHER WITH THE NUMBER OF PERMITS ISSUED FOR THE YEAR ENDING DECEMBER 31, 1879.

	PERMITS ISSUED.						RECEIPTS.	EXPENDITURES.
	2 feet.	15 inch.	12 inch.	9 inch.	6 inch.	Total.		
West Division.....			3	46	1,309	1,358	\$6,952 50	
South Division.....	2	1	2	55	808	868	4,545 00	
North Division.....			2	25	700	727	3,717 50	
License and Special Assessments							128 30	
Appropriations							2,310 00	
Totals.....	2	1	7	126	2,817	2,953	\$17,653 30	
Expenses for Superintendence, Inspection and Office Supplies.....								\$ 6,899 21
Expenditures for 3,503 15-inch by 6-inch junctions.....								3,783 24
Expenditures for 5,180 12-inch by 6-inch junctions.....								4,195 80
Expenditures for 3,377 6-inch slant junctions.....								830 41
Expenditures for 4 15-inch by 9-inch junctions.....								4 32
Expenditures for 5 12-inch by 9-inch junctions.....								4 05
Expenditures for 2 12-inch slant junctions.....								1 20
Expenditures for 8 9-inch slant junctions.....								3 12
Receipts over Expenditures.....								1,941 35
Totals.....								\$17,653 30

TABULAR STATEMENT, SHOWING TOTAL LENGTH IN FEET OF
PRIVATE DRAINS LAID DURING THE PAST YEAR, MEASURE-
MENT TAKEN FROM THE JUNCTION IN THE PUBLIC SEWER
TO THE BUILDING OR STREET LINE.

	2 feet.	15 inch.	12 inch.	9 inch.	6 inch.
Ward 1.....	80		40	907	487
Ward 2.....				35	319
Ward 3.....				291	501
Ward 4.....				743	11,261
Ward 5.....		35		175	14,281
Ward 6.....				140	7,265
Ward 7.....			35	135	2,820
Ward 8.....				105	1,123
Ward 9.....				75	336
Ward 10.....				155	715
Ward 11.....				35	1,296
Ward 12.....			35	215	10,041
Ward 13.....				191	4,035
Ward 14.....				210	13,791
Ward 15.....				305	18,009
Ward 16.....				235	1,375
Ward 17.....				105	640
Ward 18.....			40	645	1,955
Totals.....	80	35	150	4,702	90,250

Total number of feet.....95,217, or $18\frac{177}{8280}$ miles.

The several wards in which the public sewers have been extended during the past year, have immediately availed themselves of drainage. The populous wards that are more fully provided with public sewers, have the least ratio of private drainage.

This fact corroborates the reports of the Health Department in regard to the sanitary condition of the wards that lack sufficient drainage.

A new "Sewerage District Map" has been compiled by this department, showing the area of land drained by each main sewer in the city, together with each sub-main and lateral sewer discharging into the main-sewer, which is a valuable and convenient exhibit of the entire system.

During the past year the subject of proper ventilation of house-drains and their appurtenances, has evoked much thought and discussion, since many of the malarial diseases in our midst are caused by the inhalation of noxious gases from the private drainage.

In former years the importance of ventilation was seldom considered, and received too little attention in the preparation of plans for house-drainage. The majority of dwellings erected are principally devoted to the tenant class ; and it seldom occurs that additional expense is entailed by the landlord to provide for the health of the occupant, by providing for suitable ventilation in the drainage of the building.

It may appear a hardship to compel property owners to submit a plan of drainage, to be approved by the city authorities, before a permit is granted, to connect with the public sewer. This appears to be the only method whereby the evil of faulty construction can be properly checked.

It is deemed of the utmost importance to have a thorough revision of the Ordinance governing the arrangement and construction of private drains, and attachments providing for thorough ventilation.

In connection with the above subject, I desire to call your attention to the pernicious practice of permitting drain layers making direct connection from the sink of a dwelling to an out-lying vault; thence through an intervening catch-basin to the sewer in the street. Although the pipe from the sink may have a proper trap, it frequently occurs that the water from the trap evaporates during the night when not in use, or syphons out of the trap by air currents, rendering it impossible to avoid noxious gases from the vault entering the house, and produces in many cases, sickness, from which the sufferers cannot ascribe the true cause.

The total value of special assessment for private drains prepared and returned by this department for the past year, amounts to.....\$35,421 20

Value of assessment for private drains for three preceding years..... 10,673 05

Excess for the year 1879..... 24,748 15

The total number of lots or parts of lots assessed for private drains amount to 2,182. The majority of this large number will probably be contracted for and constructed during the ensuing season.

The rules and regulations are very strict, and compel first-class material and work on the part of the licensed drain-layer. The policy you have adopted of a complete enforcement of the ordinances has had a marked effect in reducing the number of complaints, and with the reforms inaugurated by yourself, I believe that the interest of the public will be largely protected.

Very respectfully submitted,

B. F. DAVENPORT,

In charge of Drain Department.

The records show that during the past year a fraction over $27\frac{1}{2}$ miles of new sewers have been added to the system, the total cost of which is $\$232,085\frac{7}{100}$, including catch basins, or $\$8,439\frac{45}{100}$ per mile. Three contracts aggregating over 19,000 lineal feet of sewer, were unfinished at the close of the year, the time for their completion being extended until the coming spring.

The total cost of all the sewers and their adjuncts, to December 31, 1879, is $\$5,280,894\frac{85}{100}$.

The Twenty-second street outlet at the lake, was completed in accordance with the plan referred to in the last annual report. Some complaint was made by residents of the neighborhood on account of the escape of offensive odors from the stone chamber built around the end of sewer. With a view of remedying this nuisance, a wooden "hood" made perfectly tight, and provided with self-acting flood-gates, was placed over the outlet. As no further complaint has been made, it is believed this arrangement serves the purpose intended.

The outlet of Twelfth street sewer at the Lake, where the nuisance was similar to that above referred to, has also been improved by extending the sewer proper further from the shore and covering it with earth.

The ends of sewers terminating in the South Branch of the river at Polk, Harrison, Twenty-second and Madison streets, have long been in a dilapidated condition; all of them have been put in good order. The repairs of the sewers at Harrison street were incidental to the rebuilding of the bridge abutments at that point.

IRON MAN HOLE AND CATCH BASIN COVERS.

have been substituted for the old style wood covers, quite extensively.

Of the correctness of the opinion expressed in the last annual report, as to the economy and other advantages in favor of the solid iron cover over that of wood, there is no doubt.

The open covers designed for the purpose of ventilation of the public sewers, by allowing the gas to escape to the street, have not been in use in this city long enough to fully establish their utility. At the request of citizens many of them have been replaced by solid covers. As to the advantages to be derived from this mode of purifying the sewers, public opinion seems at present to be divided.

THE EXTENSION OF SEWERS

the coming year, will probably be fully equal to the average in former years. In addition to filling up numerous gaps that exist, many new sewers, including some unusually large ones, are proposed, to meet the pressing demand in the outlying districts of the city which are being rapidly built up.

The subject of sewerage and other matters of great interest bearing upon the question, especially the drainage of the western section of the city, was presented at some length in the last annual report, by Mr. Benezette Williams, who, at the time, was in charge of this branch of the Public Works. The plans outlined in the report, have been under consideration during the past year, and the main features of them will probably eventually be adopted.

CLEANING SEWERS.

It will be seen by the figures presented that the removal of solid matter from the sewers and catch-basins, and the present mode of flushing them, is a laborious and expensive feature of the maintenance of the system. The cost of this particular work during the past year, amounted to nearly \$30,000. With the addition of new sewers, the expense must annually increase unless some more economical means can be devised to accomplish the purpose. The cost of flushing the sewers does not include the value of the water used for the purpose, which in the course of a year amounts to a considerable sum for pumping alone, of which the water-works gets no credit. The present plan of flushing is to draw water from the fire-hydrants, into a large wooden tank and by aid of horses carry it to the man-holes, through which the contents of the tank is delivered into the sewer. It is suggested that this mode of flushing might be improved, both as regards time and money, by connecting the sewers at suitable intervals with the adjacent water-mains, by short branch or flushing-pipes, and a simple stop-valve. The delivery end of the flushing-pipe would require to be of proper form and arrangement to adopt it to the purpose. It is believed with this combination, the services of one man, and the use of water under the ordinary pressure, that the sewers could be cleaned far more effectually and with a less quantity of water, than is now used. A radical change of this kind, of any extent in connection with the old sewers, may not be practicable, but on some of the proposed new lines of sewers, the plan might be tried without inconvenience or large expense.

BRIDGES AND VIADUCTS.

CHICAGO, December 31, 1879.

D. C. CREGIER, Esq., *City Engineer*:

SIR: I submit my report for repairs of Bridges and Viaducts for the year ending December 31, 1879. I would state that when I took charge of the bridges on the 15th day of September, 1879, I found all or nearly all of the bridges and protections in a very bad condition: in fact there was but very few of them that were safe. With the limited amount of money remaining of the appropriation of 1879, it was impossible to make any permanent improvements, but merely to keep patching where most needed. It will require a much larger sum of money for the next year, as both bridges and protections are in a rotten and unsafe condition.

Since my taking charge of the bridges, I have thoroughly repaired the protection to State street bridge; also put new floor and new joist on Madison street bridge; new floor and joist on Chicago avenue bridge; and general repairs on most all the bridges on the river.

I would recommend the rebuilding of the Lock Bridge on the Canal, near Ashland avenue. It is in an unsafe condition and liable to go down with any extra weight; also the rebuilding of protections to South Halsted and Van Buren street bridges, and general repairs to most all the other protections, as they are really unsafe. There must be a new *turn table* to State street bridge, as it is nearly impossible to turn the bridge, besides the bridge is unsafe for travel.

The abutments to both sides of Madison street bridge are in very bad condition, and require to be rebuilt; also the east abutment to Polk street bridge, and several other abutments must be repaired, as the arches over sewer outlets are in bad condition. I would recommend the entire overhauling of Adams street viaduct; the floor beams are too light. I would

take up the entire roadway, and put a 3 x 12 joist alongside of each iron beam, and well bolted to the iron beam, with new joist and floor, which I think will make a solid job. This viaduct should be attended to at once, as it is in a bad condition. I would recommend the painting of all bridges and viaducts not painted in 1879, as the iron is badly rusted and the wood is rotting, which will be prevented by being properly painted.

C. P. McKAY,

Superintendent.

In addition to the work of repairs on bridges and viaducts as reported by the Superintendent, the

EIGHTEENTH STREET VIADUCT

over the tracks of the P. and Ft. W. R. R. Co. was completed February 7th, 1879. The structure is of wrought iron, consisting of two spans. That over the tracks is a truss girder 142 feet long on centre of roadway. The other span is a plate girder 4 feet deep. The roadway is 20 feet wide, and the sidewalks are 6 feet wide. The approach to the viaduct on the west side of the river is divided, the north half ascending to viaduct and the south half descending to Lumber street. This arrangement affords convenient access—from the lumber and other yards on the river and in the immediate vicinity—to the bridge crossing the river at this point.

The sub-structure was built by James Clowry by
contract for the sum of\$14,284 00

The super-structure was built by the Keystone Bridge
Co., Pittsburgh, under contract of..... 11,194 00

Total cost, exclusive of paving\$25,478 00

KEDZIE AVENUE BRIDGE.

A new structure of wrought iron, single span resting on stone piers, across the canal, was built by Massillon Bridge Co., Ohio, at a cost of \$3,000.00, and finished on 1st March of present year. A portion of the expense of this bridge was borne by the town of Cicero.

BRIDGES AND VIADUCTS TO BE REPAIRED.

The iron work of viaduct over tracks of C. B. and Q. R. R. at Sixteenth and Halsted streets is in a very bad condition, due to corrosion and weakness of floor system. This structure should be rebuilt at an early day.

STATE STREET BRIDGE

has been reported for the past two or three years as in a dangerous condition, owing to its slender turn table. Plans have been made for a new and more substantial one, and as soon as it is constructed it will be put in place.

This bridge seems particularly unfortunate from its exposure to accident by collision from passing vessels, which it is alleged become unmanageable on account of the swift current in the river at this point, due to high winds.

ADAMS STREET VIADUCT

will require a reconstruction of the entire floor system. The present roadway is in a dangerous condition. The plans are prepared and the work will be commenced within a few weeks.

The work of erecting a wooden

FOOT BRIDGE AT ULLMAN STREET,

across the slip at that point, ordered by Council, has been deferred, owing to some legal obstacles to the right of way. As soon as this question is settled, the matter will receive attention.

In closing this report, I desire to acknowledge the uniform courtesy and support of the Commissioner in the discharge of the duties of my position; also to bear testimony to the faithfulness and industry of the gentlemen connected with the "Engineer Department."

Respectfully submitted,

DEWITT C. CREGIER,

Acting City Engineer.

STREET DEPARTMENT.

CHICAGO, December 31, 1879.

C. S. WALLER, Esq.,

Commissioner of the Department of Public Works:

DEAR SIR: I have the honor to submit to you the Fourth Annual Report of the Street Department, comprising streets, alleys, sidewalks and lamps.

There has been completed $6441\frac{10}{5280}$ miles of street improvements during the past year, as follows:

Wooden blocks	$52\frac{312}{5280}$ miles.
Medina stone	$01\frac{625}{5280}$ "
Cobble stone	$00\frac{309}{5280}$ "
Macadam	$00\frac{665}{5280}$ "
Cinders	$02\frac{642}{5280}$ "
Three-inch oak planking.....	$02\frac{167}{5280}$ "

Of the above, $43\frac{377}{5280}$ miles of old improved was reimproved.

Adding the new improvements to those reported already, will give a grand total of improved streets as follows:

Wooden blocks	$1144\frac{427}{5280}$ miles.
Cinders	$91\frac{329}{5280}$ "
Gravel	$8\frac{794}{5280}$ "
Macadam.....	$6\frac{42}{5280}$ "
Stone	$05\frac{175}{5280}$ "
Plank.....	$02\frac{167}{5280}$ "

Total number of miles $1393\frac{374}{5280}$

The following is a report of street improvements in the West Division for the year 1879:

REPORT OF STREET IMPROVEMENTS IN THE WEST DIVISION FOR THE YEAR 1879.

NAME OF STREET.	FROM.	TO.	NATURE OF IMPROVEMENTS.	NAME OF CONTRACTOR.	When Commenced.	When Finished.	Length Lineal ft.	Square yds.	Contract price per sq. yard.	REMARKS.
Adams st.....	Irving place.....	Oakley av.....	Shaw's Patent	J. B. Barnett.....	Nov. 15	Dec. 1	296.	996.44	\$1.35	Private contract.
*Adams st.....	Intersection of.....	Shaw's Patent	Shaw's Patent	W. E. Shaw.....	Dec. 2	Dec. 8	66.	896.89	1.05	Appropriation.
Desplaines st..	Monroe st.....	Fulton st.....	6 in. cedar, 1 in. floor and comp.	Ray & Whitney...	Aug. 9	Aug. 29	1,727.25	9,212.	1.13	Private contract.
*Desplaines st.	Intersection between	above points.....	6 in. cedar, 1 in. floor and comp.	W. H. Watson.....	Aug. 29	Sept. 15	478.	3,556.31	844	Appropriation.
*Eighteenth st.	Canal st.....	Viaduct	6 in. cedar, 1 in. floor and comp.	James Clowrey....	April 8	Apr. 25	365.	1,747.33	99	Appropriation.
Eighteenth st..	Union st.....	Halsted st.....	6 in. cedar, 1 in. floor and gravel.	W. H. Watson.....	Aug. 8	Aug. 15	439.20	1,888.62	95	Private contract.
Fourteenth st..	Centre av.....	Ashland av.....	Chinders	Riordon et al.....	Feb. 5	May 10	2,642.	1,393.	1.05	Private contract.
Hoyne av.....	Congress st.....	Harrison st.....	6 in. cedar, 1 in. floor and comp.	A. J. & D. D. McBean	May 5	Sept. 18	1,488.55	6,384.99	84	Private contract.
*Halsted st.....	Ohio st.....	Chicago av.....	6 in. cedar, 1 in. floor and comp.	J. B. Smith & Co..	Sept. 18	Sept. 18	400.	1,053.78	1.05	Special assessm't
*Halsted st.....	Fifteenth st.....	S. to Viaduct..	6 in. cedar, 1 in. floor and comp.	J. V. McAdams & Co.	Oct. 3	Nov. 7	665.	2,926.	80	Private contract.
Warren av.....	Leavitt st.....	Oakley av.....	Macedon	J. P. Dickey & Co..	Sept. 7	Dec. 1	1,131.	2,926.	2.46	Private contract.
*Twenty-se'd st.	Centre av.....	Morgan st.....	Planting 24 feet wide	J. B. Smith & Co..	Sept. 13	Sept. 27	1,131.	2,926.	2.46	Special assessm't
*Ashland av.....	S. line lot 10, S. J. Walker's addition.	S. to the River.	Planting 16 feet wide	J. B. Smith & Co..	Nov. 24	Dec. 6	1,043.	2,926.	1.60	Special assessm't
Total ..							10,953.	.....	per l. ft.	Special assessm't

Total, 2 miles and 393 feet.

* Note.—Streets marked with a star (*) indicate done under special assessment and by public letting; those without the star are done by private contract.

It will be seen by the preceding table that the greater part of the improvements was with cedar blocks, using lake shore gravel and composition tar, and in my opinion it makes the best wooden pavement now in use here; though the thoroughfares where there is heavy traffic, a substantial stone pavement should be substituted, and it would eventually prove the cheapest.

REPORT OF STREET IMPROVEMENTS IN THE SOUTH DIVISION FOR THE YEAR 1870.

NAME OF STREET.	FROM.	TO.	NAME OF CONTRACTOR.	When Commenced.	When Finished.	NATURE OF IMPROVEMENTS.	Lineal feet.	Square yds.	Contract price.	REMARKS.
Van Buren st.,	Wabash av.,	Chicago river.	A. J. McBean.	April 18	July 23	Paving 7 in. cedar, 3 in. floor, l. s. o., and composition, except R.R. tracks.	2,714.55	7,681.46	\$1 44	Intersect'n, same contractor, 140 square yds. including filling.
*Sherman st.,	Van Buren st.,	Polk st.,	J. G. McBean.	May 26	Oct. 20	Medina stone, broken stone found.	1,665.50	8,014.62	2 05	Intersect'n, same contractor, 140 square yds. including filling.
*Lafayette st.,	Randolph st.,	Lake st.,	S. E. Gross.	June 19	July 22	Paving 6 in. cedar, 3 in. floor, l. s. o., and composition, except R.R. tracks.	381.30	1,553.64	1 45	Intersect'n, same contractor, 140 square yds. including filling.
*Twelfth st.,	Calumet av.,	Prairie av.,	W. H. Watson.	July 1	July 31	6 in. cedar, 1 in. floor, l. s. o., and composition, except R.R. tracks.	435.	2,097.31	97	Intersect'n, same contractor, 140 square yds. including filling.
*Central av.,	Randolph st.,	S. Water st.,	J. B. Smith.	Aug. 20	Aug. 30	6 in. cedar, 1 in. floor, l. s. o., and composition, except R.R. tracks.	765.	2,899.62	884	Intersect'n, same contractor, 140 square yds. including filling.
*Polk st.,	State st.,	Chicago river.	W. H. Watson.	July 29	Oct. 22	6 in. cedar, 2 in. beam, l. s. o., and composition, except R.R. tracks.	1,697.37	4,907.63	1 50	Intersect'n, same contractor, 140 square yds. including filling.
*Adams st.,	State st.,	Chicago river.	Ray & Whitney.	Aug. 22	Oct. 13	6 in. cedar, 3 in. floor, l. s. o., and composition, except R.R. tracks.	2,519.	10,476.56	94	Intersect'n, same contractor, 140 square yds. including filling.
*Franklin st.,	Madison st.,	Lake st.,	J. B. Smith & Co.	Aug. 29	Sept. 30	6 in. cedar, 1 in. floor, l. s. o., and composition, except R.R. tracks.	1,237.80	6,881.82	97	Intersect'n, same contractor, 140 square yds. including filling.
*Taylor st.,	State st.,	Clark st.,	Ray & Whitney.	Sept. 24	Oct. 24	6 in. cedar, 1 in. floor, l. s. o., and composition, except R.R. tracks.	746.	2,454.57	55	Intersect'n, same contractor, 140 square yds. including filling.
*Lafayette st.,	Monroe st.,	Adams st.,	Ray & Whitney.	July 23	Aug. 4	6 in. cedar, 1 in. floor, l. s. o., and composition, except R.R. tracks.	386.75	2,179.05	1 294	Intersect'n, same contractor, 140 square yds. including filling.
*E. 1/2 Market st.,	Madison st.,	301 feet north.	J. B. Smith & Co.	July 31	Aug. 28	6 in. cedar, 1 in. floor, l. s. o., and composition, except R.R. tracks.	201.	1,005.	1 00	Intersect'n, same contractor, 140 square yds. including filling.
*Lake st.,	Fifth av.,	Market st.,	J. B. Smith & Co.	July 15	Aug. 20	6 in. cedar, 1 in. floor, l. s. o., and composition, except R.R. tracks.	80.	653.04	3 378	Intersect'n, same contractor, 140 square yds. including filling.
*Lake st.,	Lafayette st.,	Fifth av.,	J. B. Smith & Co.	Oct. 13	Oct. 18	6 in. cedar, 1 in. floor, l. s. o., and composition, except R.R. tracks.	323.04	1,234.80	1 134	Intersect'n, same contractor, 140 square yds. including filling.
*Lake st.,	Lafayette st.,	State st.,	J. B. Smith & Co.	Nov. 17	Nov. 30	6 in. cedar, 1 in. floor, l. s. o., and composition, except R.R. tracks.	1,296.07	6,814.22	1 35	Intersect'n, same contractor, 140 square yds. including filling.
*Twenty-second st.,	Lafayette st.,	Fifth av.,	W. H. Stow.	Aug. 13	Aug. 28	6 in. cedar, 1 in. floor, l. s. o., and composition, except R.R. tracks.	324.	1,237.62	1 37	Intersect'n, same contractor, 140 square yds. including filling.
*Twenty-second st.,	Wentworth av.,	Ray & Whitney.	Ray & Whitney.	Sept. 30	Oct. 30	6 in. cedar, 1 in. floor, l. s. o., and composition, except R.R. tracks.	222.	937.61	87	Intersect'n, same contractor, 140 square yds. including filling.
*Madison st.,	Dearborn st.,	Ray & Whitney.	Ray & Whitney.	Oct. 14	Oct. 28	6 in. cedar, 1 in. floor, l. s. o., and composition, except R.R. tracks.	190.66	681.83	88	Intersect'n, same contractor, 140 square yds. including filling.
*Wabash av.,	Twenty-second st.,	A. H. Perkins.	A. H. Perkins.	Oct. 14	Oct. 28	6 in. cedar, 1 in. floor, l. s. o., and composition, except R.R. tracks.	597.55	1,295.71	1 184	Intersect'n, same contractor, 140 square yds. including filling.
*Culbourn place.	Lafayette st.,	S. Cross.	S. Cross.	Aug. 17	Aug. 30	6 in. cedar, 3 in. floor, l. s. o., and composition, except R.R. tracks.	110.	174.22	1 73	Intersect'n, same contractor, 140 square yds. including filling.
Total.....							16,607.88	86,858.37		

Total No. of Miles, 3 768.

* Note.—Streets marked * indicate done under special assessment and by public letting; those without star are done by private contract.

REPORT OF STREET IMPROVEMENTS IN THE NORTH DIVISION FOR THE YEAR 1879.

NAME OF STREET.	FROM.	TO.	NAME OF CONTRACTOR.	When Commenced.	When Finished.	NATURE OF IMPROVEMENTS.	Lineal feet.	Square yds.	Contract Price.	REMARKS.
Michigan st....	Wells st.....	Kinsbury st....	R. McLellan.....	April 15	June 20	Paving with 7 in. cedar, 1 in. floor, L. s. g. and composition, etc.....	1,166.45	6,931.25	\$1 37	Inters'n paved by same contract for \$1.36 per sq. yd. incl. filling.
Bremer st.....	Chicago av.....	Oak st.....	Olof Vidar	May 28	June 10	Paving 6 in. cedar, 1 in. floor, L. s. g.	1,367.50	5,231.72	1 06	
Michigan st.....	State st.....	40 ft. E. of Dearborn av.....	W. H. Watson....	July 14	Aug. 7	Paving 8 in. cedar, 1 in. floor, g. & co.	363.76	1,859.22	1 17	
N. Halsted st..	Sophia st.....	Fullerton av....	J. V. McAdams & Co	Aug. 8	Sept. 5	Paving 6 in. cedar, 1 in. floor, L. s. g.	1,990.50	8,712.21	90	
*N. Wells st., sundry lots..	Granger st.....	Menomonee st..	J. B. Smith & Co.	Sept. 28	Oct. 8	Paving 6 in. cedar, 1 in. floor, L. s. g.	1,410.09	2,506.84	77	Inters'n by same contract at 80c. sq. yd., sundry lots only.
*N. Halsted st.	Division st.....	Clybourne av....	J. B. Smith & Co.	Oct. 6	Oct. 29	Paving 8 in. cedar, 1 in. floor, L. s. g. and composition	2,253.52	10,092.69	87	
						Total.....	8,538.82	35,253.93		

Total No. of miles, 1.3248.

* Note.—Streets marked with a star (*) indicate work done by special assessment; unmarked streets by private contract.]

It will be seen by the foregoing reports that the contractors charged the property owners on an average twenty-five per cent. more than they charged the city for the very same work, on the same street, and done at the same time.

It is obvious, therefore, that it is to the interest of property owners desiring the improvement of their streets, that the same be done under the usual form of assessment, that they may secure the benefit of competition in the awarding of contracts, thereby securing the lowest price at which the work may be done.

Many of our paved streets are in a very bad condition, and beyond the possibility of repair, and should at an early day be wholly repaved. The expense could not exceed one dollar and twelve cents per square yard, which, on the usual width of roadway, would not amount to over \$56.00 for each 25-foot lot, or a little over two dollars for each lineal foot of frontage. This price would secure the best form of cedar block pavement, and should remain in good condition for at least ten years.

Many of the unimproved streets, which are quite impassable during a considerable portion of the year, should be curbed and filled, and a top dressing of Macadam to the width of 18 feet in the center of the street, the whole improvement, when completed, to be eight inches below the established grade. This improvement would, at a nominal cost, make the streets uniform in appearance, passable at all seasons of the year, and would prepare a substantial foundation to receive at some future time a wooden block pavement, or any other permanent improvement.

The contract for sweeping and cleaning the paved streets was awarded to C. T. Hotchkiss, for twenty-one and $\frac{5.0}{100}$ (\$21 $\frac{5.0}{100}$) dollars per mile for each time swept and cleaned. The contract was from the 1st of June to the 31st of December. The first estimate allowed for the work was given on the 9th day of July, and the final or last was given on the 29th day of December.

The following table exhibits the number of miles done in each division of the city per month :

STREET CLEANING, 1879.

DIVISIONS.	JUNE.	JULY.	AUG.	SEPT.	OCT.	NOV.	DEC.	TOTAL.
SOUTH	47.30	78.92	84.61	60.14	67.88	21.74	3.60	364.19
NORTH	30.36	43.56	44.52	40.78	37.51	7.43	-----	204.16
WEST	49.60	80.72	79.38	75.94	67.88	3.15	-----	356.67
TOTAL MILES	127.26	203.20	208.51	176.86	173.27	32.32	3.60	925.02

DIVISION.	MILES.	COST.
NORTH.....	204.16	\$4,389 44
SOUTH	364.19	7,830 08
WEST	356.67	7,668 40

The following table shows the work done by the carpenters under the head of

REPAIRS,

and also the work of the pavers under the same head:

FOR WHAT USED.	NORTH DIVISION.				SOUTH DIVISION.				WEST DIVISION.			
	No. rep.	Sq. yds.	Lumber.		No. rep.	Sq. yds.	Lumber.		No. rep.	Sq. yds.	Lumber.	
			Pine.	Oak.			Pine.	Oak.			Pine.	Oak.
Aprons	505	12,372			502	30,138			941	66,151		
Street crossings	109	12,270	10,378		196	5,939	35,900	532		29,022	14,065	
Alley crossings	39	1,980	2,185		74	4,946	4,130	201		9,116	11,535	
Drain boxes	15	916			18	1,200			41	4,690		
Street culverts	29	1,755	2,343		50	12,300	3,540	304		18,644	21,787	
Alley culverts	9	4,340	164	67		21,452	3,200	80		4,297	4,312	
Paving, gen. repairs	1,370				2,201				5,053			
Paving, sewer depart.	903				345				792			
Paving, water depart.	40				262				97			
Paving, gas company									468			
Paving, street permits	621				805				650			
Sidewalk, gen. repairs		19,773	166			69,509				74,305		
Sidewalk, steps		3,418				2,430				3,789		
Sidewalk, railings		2,952				3,479				6,245		
Sidewalk, intersect'ns		9,896				11,672		178		19,888		
General repairs		300				25,500	10,040			13,015	13,546	
Appro's, 18th st. viad.										10,000		
App's, Kinzie st. viad.										560	462	
Appro's, Canal st. viad.											4,914	
Appro's, 12th st. viad.											1,600	
Planking in front 83th st. engine house						3,196						
TOTAL		2,934	66,067	15,296		3,703	191,761	56,810		7,060	259,776	72,121

DEPARTMENT OF PUBLIC WORKS.

DIVISIONS.	Cleaning Im- proved Sts.	Repairing Streets.	Lumber.	Blocks.	Spike, Nails, Repairs, etc.	Gravel.	Stone.	Cinders.	Rent of Lot.	Miscel.
NORTH	\$4,389 44	\$16,750 39	\$ 604 74	\$ 877 29	\$190 25	\$136 67	-----	\$ 50 00	\$25 00	-----
SOUTH	7,830 08	26,675 05	2,096 24	1,095 50	338 45	183 15	\$ 70 20	202 75	-----	\$209 60
WEST	7,668 40	45,041 75	4,052 04	2,488 10	641 11	169 87	634 44	27 90	50 00	566 84
TOTAL.....	\$19,887 92	\$88,476 19	\$6,753 02	\$4,460 80	\$1,109 81	\$489 69	\$704 64	\$280 65	\$75 00	\$776 44

The above form shows the cost of cleaning and repairing the improved streets, and it also shows the cost of the materials used for the same.

STREET DEPARTMENT.

NORTH DIVISION.			SOUTH DIVISION.			WEST DIVISION.		
Paved streets cleaned.	Unimproved streets cleaned.	Cindered streets repaired, etc.	Paved streets cleaned.	Unimproved streets cleaned.	Cindered streets repaired, etc.	Paved streets cleaned.	Unimproved streets cleaned.	Cindered streets repaired, etc.
22.31	62.41	1.00	77.35	87.77	1.33	61.03	120.18	6.90
Miles.								

Streets in the above form have been cleaned from one to six times during the year, particular attention having been paid to the principal streets, and a large portion of the above mentioned unimproved streets have been ploughed and graded so as to give them proper shape.

And in addition to the above, the several street crossings, bridges, viaducts, and public alleys, have been cleaned several times during the year.

The following is a statement of

SIDEWALKS

constructed during the past year:

NORTH DIVISION.

Material.	Lineal feet.	Length in miles.
Pine.....	86,416	
Stone	4,108	
Concrete	224	
	90,748	17.19-100

SOUTH DIVISION.

Material.	Lineal feet.	Length in miles.
Pine.....	38,814	
Stone	4,346	
Concrete	360	
	43,520	8.24-100

WEST DIVISION.

Material.	Lineal feet.	Length in miles.
Pine.....	108,365	
Stone	1,080	
	109,445	20.73-100

SPECIAL ASSESSMENTS.

Material.	Lineal feet.	Length in miles.
Pine.....	23,984	4.54-100

MAKING A TOTAL OF

Pine sidewalk, 257,579 lineal feet, equal to 48.78-100 miles.	
Stone " 9,534 " " 1.81-100 "	
Concrete " 584 " " 0.11-100 "	

Total number of miles.....50.70-100 miles.

Of the above three and $\frac{5116}{8280}$ miles of sidewalk were constructed where none were ever built. This, in addition to the sidewalks

already constructed, gives a grand total of $715\frac{1132}{180}$ miles of sidewalks built to date.

The following is the amount expended on the Washington and LaSalle street Tunnels for the past year:

Washington Street	\$1,444.45
LaSalle Street	1,886.39

The extra expenditure on the LaSalle Street tunnel was caused by constructing an iron railing on the parapet wall on the south side thereof.

The following is the report of the

STREET LAMP DEPARTMENT

for the past year:

CHICAGO, December 31, 1879.

WILLIAM FOGARTY, Esq., *Superintendent of Streets, Etc.:*

DEAR SIR—I herewith submit my report of street lamps made and repaired for the year 1879.

At the end of the year there were 10,882 lamps in the city, an addition of 97 lamps during the year, divided among the three divisions of the city, as follows, to-wit:

West Division	5,519
South Division.....	3,122
North Division.....	2,241
Total	10,882

The total number of lamps repaired during the year aggregated 16,221, being 915 less than last year.

The whole number of lamps repaired with glass amounted to 14,132, being 935 less than last year.

The number of lamps on which the tin work was repaired, painted, and glass put in, was 2,089, an increase from last year year of 386.

During the year, 558 lamps were condemned and replaced by new ones, being 192 more than last year.

There were also made 588 three-quarter new lamps, or all new except the top, and on the top new strips were put to hold the glass—427 were made in this way last year. These lamps will last almost as long as new ones. All of them were made with the patent iron socket and malleable iron uprights. It will be seen that in twenty-three months in which the city has been repairing and making their own lamps, 1,939 lamps have been replaced by first-class new ones. This number includes the three-quarter lamps. In the same length of time, under the contract system, not more than fifty new lamps would have been put on, and those of the commonest kind. Included in these new lamps were 173 suited for the "Giroux" patent street guide, and cost more than the ordinary lamp.

The average number of lamps broken was 45 per day.

There was used for glazing, 459 boxes of glass, containing 10,175 side lights, 3,344 door lights, 6,144 top lights—in all 19,663 lights. In 1878 there was used 21,457 lights; in 1877 there was used 25,121 lights.

I attribute this reduction to the large number of new lamps that have been put on, the glass being held in place by malleable iron catches, and the lamp set firm on the post, so that it does not vibrate with the wind. In the old lamp a large amount of glass is blown out and broken by storms. By continuing to make new lamps at about the same proportion as now for a few years, and repair others that are in condition to repair, the expense of this department will be comparatively small, when taking into account the thorough manner in which old lamps

are repaired and painted, the number of new lamps made, and the small number of lamps allowed to stand unrepaired, it cost less than the lowest contract ever let by the city for repairing lamps.

The average number of lamps out of repair during the year 1876, as reported by police department (this was the last year the work was let by contract) was 114; whole number reported, 41,669.

Average number of lamps out of repair during the year 1879, as reported by police department, 26; whole number reported, 9,654.

The cost was as follows:

REPAIRING LAMPS.

Repairing and painting tin work.....	\$1,629 62
Cost of glass	1,319 00

NEW LAMPS.

Cost of three-quarter lamps	\$ 805 56
Cost of new lamps	1,215 95
Cost of new lamps for patent guide.....	655 67

CREDIT.

95 new lamps for special assessment department, and to be paid from that fund.....	\$285 00
Gas fitting, etc., at Indiana and Erie streets Viaduct....	64 34
Amount collected for replacing damage done by runaway teams, etc.....	154 35
Stock on hand.....	175 50

MISCELLANEOUS EXPENSES.

Horse-shoeing, tools and wagon repairs.....	\$195 11
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GAS BURNERS.

5 gross brass checks, 13 gross brass pillars, 30 gross lava
tips\$150 28

Respectfully,

JOHN STEWART,

In charge Lamp Department.

The following is a statement of the cost for the maintenance
of the different Parks for the past year:

UNION SQUARE.

Labor.....	\$ 20 00	
Filling.....	108 90	
		\$128 90

WASHINGTON PARK.

Labor	\$491 50	
Lawn Mower.....	18 00	
		\$509 50

ELLIS PARK.

Labor.....	\$474 00	
		\$474 00

LAKE PARK.

Labor.....	\$1,461 56	
Repairing mower.....	7 68	
Hardware	1 42	
Sprinkling in front of Park.....	180 00	
Hose	25 50	
Coal	12 00	
Lawn mower.....	47 96	
		\$1,736 12

STREET DEPARTMENT.

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JEFFERSON PARK.

Labor.....	\$711 00	
Feed for fowl.....	12 72	
Hardware.....	2 25	
		\$725 97

UNION PARK.

Labor.....	\$1,015 34	
Feed.....	240 67	
Coal	8 40	
Gas	18 08	
Hardware.....	3 75	
Plumbing.....	31 10	
Repairing mower.....	17 78	
		\$1,335 12

VERNON PARK.

Labor.....	\$767 24	
Flowers	7 74	
Feed	4 00	
		\$778 98

WICKER PARK.

Labor.....	\$713 00	
Coal	2 00	
Oil can.....	25	
		\$715 25

CAMPBELL PARK.

Trees.....	\$ 70 00	
Painting Fence.....	100 00	
Filling.....	33 00	
Hose	18 00	
		\$221 00

SUMMARY.

Total amount expended West Division.....	\$61,340 45	
Credit by cash received for repairs under permits.....	\$1,221 62	
Credit by cash received for repairs from Gas Company.....	287 25	
Credit by cash received for repairs from Sewerage Department.....	396 00	
Credit by cash received for repairs from Water Department.....	60 00	
		1,965 42

Net amount expended West Division..... \$59,375 03

Total amount expended South Division.....	\$38,700 82	
Credit by cash received for repairs under permits.....	\$573 00	
Credit by cash received for repairs from Sewerage Department.....	172 50	
Credit by cash received for repairs from Water Department.....	164 41	
		849 91

Net amount expended South Division..... \$37,850 91

Total amount expended North Division.....	\$23,032 78	
Credit by cash received for repairs under permits.....	\$440 00	
Credit by cash received for repairs from Sewerage Department.....	612 75	
Credit by cash received for repairs from Water Department.....	24 79	
Credit by cash received for filling in Union Square.....	82 50	
		1,160 04

Net amount expended North Division... \$21,872 74

RECAPITULATION.

Expended West Division.....	\$59,375 03
Expended South Division.....	37,850 91
Expended North Division.....	21,872 74
Total.....	\$119,098 68
Expended on Parks.....	6,624 84
Expended on Washington and LaSalle Street Tunnels.....	3,430 84
Grand total.....	\$129,154 36

Respectfully submitted,

WILLIAM FOGARTY,

Superintendent of Streets.

SPECIAL ASSESSMENT DEPARTMENT.

CHICAGO, December 31, 1879.

CHARLES S. WALLER, Esq.,

Commissioner of Public Works:

DEAR SIR—I submit herewith, in tabular form, a statement of special assessments made in this department during the past year, with a summary of the estimated cost of the same; also, a recapitulation of the number of miles of street improvement of the various kinds, the number of lamp posts in the city, and the amount of special assessments made in each year during the past nineteen years.

In my last report I pointed out the injustice done to both property owners and the city by the private contract system, by giving the prices paid by property owners on several streets to private contractors, and the amounts for which the same kind of work, at the intersections of the same streets, was done at public letting.

By referring to the report of Mr. Fogarty, Superintendent of the Street Department, you will see at a glance, that during the past year, in every case where there was a full and free competition, the work was done at a much less price than the same kind of work was done by private contract.

The figures given in his tables showing the amount of street work done during the past year, with the prices paid by private contract and by public letting, are the strongest argument that can be made in favor of the abolishment of this onerous system.

During the past year a number of assessments have been made for improving several of the lighter traveled streets with Macadam and gravel, instead of wooden blocks. This is a new departure from the old beaten track which has been so long followed, and if a suitable top-dressing can be obtained, I think there is but little doubt that the vexed question of the proper material for light driving streets will have been solved.

The limestone in the vicinity of Chicago is scarcely hard enough to make a good street of itself, but with a top-dressing of some harder substance, either broken granite or clean gravel, I can see no reason why we should not have good streets at a reasonable cost.

STATEMENT OF ASSESSMENTS FOR WOODEN BLOCK
PAVEMENT.

No. War- rants.	NAME OF STREET.	FROM.	TO.	Amount of Assessm't.
3267	Eighteenth st.	State st.	Grove st.	\$ 1,007 04
3271	Washington st.	Clark st.	LaSalle st.	447 78
3276	N. Halsted st.	Division st.	Clybourne av.	9,919 92
3280	Washington st.	Fifth av.	Franklin st.	1,283 08
3281	Thirty-first st.	State st.	L. S. and M. S. R. R.	886 88
3286	W. Randolph st.	Desplaines st.	W. Water st.	3,095 03
3287	N. Halsted st.	Sophia st.	Fullerton av.	9,206 60
3288	Adams st.	State st.	S. Branch Chicago river.	12,497 45
3289	Harrison st.	State st.	Pacific av.	4,868 85
3290	Harrison st.	56 E. of Sherman st.	Franklin st.	4,504 70
3291	Franklin st.	Lake st.	Madison st.	7,340 84
3301	Lincoln st.	W. Adams st.	W. Jackson st.	2,659 78
3306	Michigan st.	N. Wells st.	Kingsbury st.	2,081 79
3308	Twenty-fifth st.	Prairie av.	Calumet av.	2,396 35
3326	Central av.	Randolph st.	S. Water st.	3,116 68
3343	Van Buren st.	Wabash av.	Market st.	1,407 15
3345	LaSalle st.	Monroe st.	Adams st.	851 34
3346	Michigan st.	N. Clark st.	N. Wells st.	1,231 36
3350	Lake st.	Fifth av.	Market st.	812 51
3351	Polk st.	State st.	S. Branch Chicago river.	1,688 05
3352	Michigan st.	Dearborn av.	N. State st.	449 17
3353	Washington st.	Fifth av.	LaSalle st.	1,692 77
3354	Lincoln av.	N. Wells st.	Centre st.	1,735 85
3357	N. Halsted st.	Sophia st.	Fullerton av.	1,860 14
3365	Desplaines st.	W. Monroe st.	Fulton st.	2,608 95
3382	S. Water st.	Michigan av.	Central av.	806 41
3383	Canalport av.	Halsted st.	W. Twenty-second st.	5,856 44
3385	Lake st.	Fifth av.	LaSalle st.	895 25
3400	Lincoln av.	Centre st.	Fullerton av.	14,712 33
3402	Fifth av.	Monroe st.	Van Buren st.	8,092 22
3412	N. Halsted st.	W. Ohio st.	W. Chicago av.	316 40
3413	Sheldon st.	W. Madison st.	W. Randolph st.	2,769 91
3414	Washington st.	S. L. 10 L. 3, 4 and 5.	Block 7, Old Town.	287 85
3419	Larrabee st.	Centre st.	Webster av.	7,267 78
3420	W. Washington st.	Clinton st.	Halsted st.	9,121 30
3421	River st.	Wabash av.	250 E. Michigan av.	853 16
3422	Washington st.	Franklin st.	Market st.	1,921 44
3429	Lake st.	LaSalle st.	State st.	6,549 18
3430	Elizabeth st.	W. Lake st.	W. Indiana st.	9,284 63
				\$148,383 36

STATEMENT OF ASSESSMENTS FOR MISCELLANEOUS STREET IMPROVEMENTS.

No. Warrants.	NATURE OF IMPROVEMENT.	NAME OF STREET.	FROM.	TO.	Amount of Assess't.
3268	Curbing and Filing	Walton place	Rush st.	Pine st.	\$ 181 33
3292	"	Robey st.	W. Madison st.	W. Harrison st.	5,482 79
3329	Filling and Plank'g	W. Tw'ty-sec'd st.	Morgan st.	Centre av.	2,633 39
3347	Filling	Flournoy st.	Leavitt st.	Robey st.	959 73
3348	"	DeKalb st.	Leavitt st.	Flournoy st.	869 72
3359	Macadamizing	Warren av.	Leavitt st.	Oakley av.	543 31
3366	"	Ellis av.	Douglas av.	Egan av.	11,603 61
3367	Filling	Leavitt st.	W. Harrison st.	W. Taylor st.	1,019 98
3368	"	W. Polk st.	Ashland av.	Wood st.	1,342 86
3369	"	Hermitage av.	W. Polk st.	York st.	127 34
3370	"	W. Taylor st.	Robey st.	Oakley av.	1,800 07
3371	"	W. Polk st.	Irving av.	Robey st.	1,414 07
3372	"	Wood st.	W. Polk st.	W. Eighteenth st.	4,872 69
3373	"	Wood st.	W. Harrison st.	W. Congress st.	217 03
3374	"	Wood st.	W. Polk st.	York st.	172 28
3375	"	Marshfield av.	W. Polk st.	328 feet North	84 47
3376	"	Evergreen place	Leavitt st.	Oakley av.	249 13
3377	"	Lexington st.	Hoyne av.	Leavitt st.	491 26
3378	"	W. Taylor st.	Lafin st.	Ashland av.	486 72
3379	"	Hoyne av.	W. Harrison st.	DeKalb st.	241 94
3380	"	Kendall st.	W. Polk st.	W. Taylor st.	897 82
3381	"	Paulina st.	W. Polk st.	York st.	215 84
3401	Macadamizing	Calumet av.	Thirty-first st.	Douglas av.	14,340 94
3418	Filling	W. Harrison st.	Campbell av.	Cicero court	310 86
3423	Planking	Centre av.	W. Twenty-sec'd st.	S. Terminus	1,981 30
					\$52,410 48

STATEMENT OF ASSESSMENTS FOR THE ERECTION OF LAMP POSTS.

No. Warrants.	No. Posts	NAME OF STREET.	FROM.	TO.	Amount of Assessm't.
3269	5	Larrabee st.	Belden av.	Fullerton av.	\$ 161 65
3270	15	Webster av.	Racine av.	Clybourne av.	454 95
3272	6	W. Van Buren st.	Western av.	Campbell av.	193 98
3273	26	N. Halsted st.	Canal bridge	North av.	841 58
3274	22	Hinman st.	Ashland av.	Robey st.	711 26
3275	15	W. Randolph st.	Halsted st.	W. Water st.	542 70
3277	23	S. Dearborn st.	Fourteenth st.	Archer av.	743 59
3278	11	Kansas st.	Throop st.	Lafin st.	355 63
3279	11	Nebraska st.	Throop st.	Lafin st.	355 63
3328	3	Oak st.	N. Market st.	Townsend st.	102 04
3384	4	W. Sixteenth st.	Morgan st.	Brown st.	116 50
3394	8	W. Monroe st.	California av.	Barry Pt. road	224 00
3395	4	California av.	W. Madison st.	W. Monroe st.	106 50
3396	7	N. Halsted st.	Belden av.	Fullerton av.	196 00
3415	16	Barber st.	Canal st.	Halsted st.	448 00
3426	6	Bissell st.	Centre st.	Sophia st.	168 00
3427	2	Centre st.	Fremont st.	Bissell st.	57 00
3428	6	O'Brien st.	Union st.	Jefferson st.	168 00
190					\$5,947 01

STATEMENT OF ASSESSMENTS FOR LAYING WATER
SERVICE PIPES.

No. War- rants.	NAME OF STREET.	FROM.	TO.	Amount of Assessm't.
3283	Thirty-first st.	State st.	L. S. and M. S. R. R.	\$ 130 00
3284	Michigan st.	N. Clark st.	Kingsbury st.	137 63
3285	W. Randolph st.	Desplaines st.	Canal st.	292 13
3303	Fifth av.	Van Buren st.	Taylor st.	1,742 55
3307	Bremer st.	Chicago av.	Oak st.	167 68
3344	LaSalle st.	Monroe st.	Adams st.	84 00
3355	W. Division st.	Milwaukee av.	N. Branch Chicago river.	1,350 20
3361	Warren av.	Leavitt st.	Oakley av.	340 90
3365	Ellis av.	Douglas av.	Egan av.	2,102 25
3398	Indiana av.	Twenty-ninth st.	Thirty-first st.	481 05
3403	Fifth av.	Monroe st.	Van Buren st.	934 65
3406	S. Park av.	Twenty-second st.	Twenty-ninth st.	215 65
3407	Lincoln av.	Belden av.	Fullerton av.	817 75
3408	N. Clark st.	North av.	N. Wells st.	509 85
3409	Thirtieth st.	L. S. and M. S. R. R.	Prairie av.	254 25
3410	Calumet av.	Thirty-second st.	Douglas av.	1,291 10
3411	Calumet av.	Thirty-first st.	Thirty-second st.	803 00
3431	Elizabeth st.	W. Lake st.	W. Indiana st.	379 00
				\$12,033 64

STATEMENT OF ASSESSMENTS FOR LAYING PRIVATE
DRAINS.

No. War- rants.	NAME OF STREET.	FROM.	TO.	Amount of Assessm't.
3282	Thirty-first st.	State st.	L. S. and M. S. R. R.	94 70
3349	Twenty-fifth st.	Prairie av.	Calumet av.	107 50
3356	W. Division st.	Milwaukee av.	N. Branch Chicago river	1,066 00
3358	N. Halsted st.	Belden av.	Fullerton av.	215 00
3360	Warren av.	Leavitt st.	Oakley av.	239 00
3362	Ellis av.	Douglas av.	Egan av.	3,406 25
3397	Prairie av.	Thirty-first st.	Thirty-third st.	522 50
3399	Indiana av.	Twenty-ninth st.	Thirty-first st.	601 75
3404	Calumet av.	Thirty-third st.	Douglas av.	1,683 50
3405	Calumet av.	Thirty-first st.	Thirty-second st.	1,023 75
3424	Lincoln av.	Belden av.	Fullerton av.	1,416 25
3425	Thirtieth st.	State st.	Prairie av.	225 00
				\$10,621 20

STATEMENT OF ASSESSMENTS FOR STREET AND ALLEY
OPENINGS AND WIDENINGS.

No. War- rants.	NATURE OF IMPROVEMENT.	NAME OF STREET.	FROM.	TO.	Amount of Assess't.
3293	Opening	Arnold st.	Twenty-sixth st.	Twenty-sev'h st.	\$ 9,437 41
3294	"	W. Congress st.	W. Terminus	Leavitt st.	3,885 34
3295	"	Alley	Twenty-fourth st.	26 Mich. and Ind.	2,300 64
3296	Widening	Alley	Block 117	School section	8,896 00
3297	Opening	Butterfield st.	Twenty-sixth st.	Twenty-sev'h st.	14,447 34
3298	Widening	State st.	Jackson st.	Harrison st.	83,456 62
3299	"	State st.	Harrison st.	Twelfth st.	186,971 91
3300	Opening and Wid'g	N. Franklin st.	North av.	Menomonee st.	28,847 82
					\$338,143 08

STATEMENT OF ASSESSMENTS FOR THE CONSTRUCTION
OF SIDEWALKS.

No. War- rants.	Side of Street	NAME OF STREET.	FROM.	TO.	Amount of Assessm't.
3259	B	Indiana st.	Dearborn av.	N. branch Chicago riv.	\$ 726 95
3290	B	Chicago av.	N. Clark st.	N. branch Chicago riv.	450 10
3261	W	Seeley av.	W. Madison st.	W. Monroe st.	101 57
3262	B	Huron st.	Dearborn av.	Kingsbury st.	416 92
3263	B	Ontario st.	N. Clark st.	Kingsbury st.	701 48
3264	N	Thirty-third st.	Indiana av.	S. Park av.	67 84
3265	B	Seymour st.	Hubbard st.	Grand av.	109 65
3266	E	Rhodes av.	Thirty-third st.	Douglas av.	38 48
3292	S	Napoleon place.	Wentworth av.	Fifth av.	75 60
3303	B	Wentworth av.	Twenty-second st.	Twenty-ninth st.	325 58
3304	E	Sanger st.	McGregor st.	Twenty-sixth st.	92 51
3309	B	Prairie av.	Thirty-first st.	Thirty-third st.	344 27
3310	B	Vincennes av.	Douglas av.	Egan av.	180 45
3311	B	Hoynes av.	W. Madison st.	W. Harrison st.	210 96
3312	B	Walnut st.	Sacramento st.	Francisco st.	105 42
3313	N	Twenty-seventh st.	Quarry st.	Lime st.	107 80
3314	B	Mary st.	Hickory st.	C. A. and S. L. R. R.	139 53
3315	B	Hubbs st.	Thirty-third st.	Douglas av.	229 03
3316	B	Bryant av.	Vincennes av.	Stanton av.	112 26
3317	E	Lime st.	Archer av.	Twenty-seventh st.	162 92
3318	E	Lowes st.	Twenty-eighth st.	Thirtieth st.	270 81
3319	S	McGregor st.	Sanger st.	250 feet east.	52 81
3320	E	Emerald av.	Archer av.	Kossuth st.	49 30
3321	S	Bushnell st.	Archer av.	Hanover st.	64 84
3322	S	Thirty-first st.	Ashland av.	Lincoln st.	37 62
3323	W	Hoynes av.	Ambrose st.	Blue Island av.	107 91
3324	W	Francisco st.	W. Madison st.	W. Washington st.	157 00
3325	W	Albany av.	W. Madison st.	Fulton st.	161 30
3327	B	Staunton st.	W. Madison st.	W. Lake st.	190 07
3330	B	Indiana av.	Eighteenth st.	Twentieth st.	90 09
3331	B	Canal st.	W. Kinzie st.	W. Eighteenth st.	3,214 36
3332	B	W. Jackson st.	Clinton st.	Halsted st.	577 83
3333	B	W. Jackson st.	Halsted st.	Ashland av.	409 64
3334	B	Prairie av.	Twenty-seventh st.	Thirty-first st.	135 82
3335	N	Calumet av.	Thirty-third st.	Douglas av.	177 68
3336	B	W. Madison st.	Rockwell st.	California av.	179 88
3337	B	Grove st.	Eighteenth st.	Stewart av.	84 94
3338	B	Morgan st.	W. Harrison st.	W. Erie st.	577 31
3339	B	Ogden av.	Warren av.	W. Adams st.	114 00
3340	B	Ada st.	W. Randolph st.	Hubbard st.	177 02
3341	N	W. Thirteenth st.	Wood st.	Western av.	404 26
3342	B	Walnut st.	Ashland av.	Western av.	453 30
3364	B	Leavitt st.	W. Madison st.	W. Lake st.	69 66
3386	B	Hubbard st.	Halsted st.	Western av.	1,423 79
3387	B	Paulina st.	W. Harrison st.	W. Chicago av.	1,413 33
3388	B	Cottage Grove av.	Twenty-second st.	Twenty-ninth st.	611 45
3389	B	Cottage Grove av.	Twenty-ninth st.	Egan av.	739 65
3390	B	Curtis st.	W. Washington st.	W. Erie st.	531 87
3391	B	Carpenter st.	W. Washington st.	W. Chicago av.	677 92
3392	B	Milwaukee av.	North av.	Waubensia av.	52 86
3393	B	Prairie av.	Lot 12 and 13, block 4.	Wm. Jones' addition	28 92
3416	B	W. Madison st.	Canal st.	Centre av.	998 85
3417	B	W. Madison st.	Centre av.	Rockwell st.	2,509 16
					\$21,424 66

SUMMARY.

Total assessments for wooden block
pavement, including curbing and
filling:

North Division.....	\$48,781 34	
South Division.....	64,205 98	
West Division.....	35,396 04	
		\$148,383 36

Total assessments for street and alley
openings and widenings:

North Division.....	28,847 82	
South Division.....	305,409 92	
West Division.....	3,885 34	
		338,143 08

Total assessments for the erection of
lamp posts:

North Division.....	1,981 22	
South Division.....	743 59	
West Division.....	3,222 20	
		5,947 01

Total assessments for laying water ser-
vice pipes:

North Division.....	1,632 91	
South Division.....	8,068 50	
West Division.....	2,332 23	
		12,033 64

Total assessments for laying private
drains:

North Division.....	1,631 25	
South Division.....	7,664 95	
West Division.....	1,325 00	
		10,621 20

Total assessments for constructing
plank sidewalks:

North Division.....	2,295 45	
South Division.....	4,182 58	
West Division.....	14,946 63	
		21,424 66

Total assessments for miscellaneous
street and alley improvements:

North Division.....	181 33	
South Division.....	25,844 55	
West Division.....	26,384 60	52,410 48

Total assessments for North, South and
West Divisions.....

\$588,963 43

Total assessments for North Division..	85,351 32	
Total assessments for South Division..	416,120 07	
Total assessments for West Division..	87,492 04	
		\$588,963 43

Total to be paid from appropriation
fund:

North Division.....	14,184 48	
South Division.....	22,856 82	
West Division	16,484 67	
		53,525 97

Total estimated cost of all improve-
ments in the North, South and
West Divisions.....

\$642,489 40

Total number of lamp posts erected by
assessment:

NORTH DIVISION.

From January 1, 1879, to January 1, 1880.....	59	
Posts erected prior to January 1, 1879	2,173	
		2,232

SOUTH DIVISION.

From January 1, 1879, to January 1, 1880.....		
Posts erected prior to January 1, 1879	3,110	
		3,110

WEST DIVISION.

From January 1, 1879, to January 1, 1880.....	40	
Posts erected prior to January 1, 1879	5,407	
		5,447

Total number of posts erected by special assessment.....		10,789
In addition to the above, there are bridge and viaduct posts, not provided for by assessment, making the total number of lamp posts in the city		10,883

The street improvements made during the past year, in addition to those previously reported, gives the following

RECAPITULATION.

583,331 lineal feet of wooden block pavement, equal to.....	110 $\frac{3531}{8280}$ miles
5,071 lineal feet of stone pavement, equal to.....	$\frac{5071}{8280}$ miles
48,849 lineal feet of cindering, equal to..	9 $\frac{329}{8280}$ miles
42,824 lineal feet of graveling, equal to.....	8 $\frac{584}{8280}$ miles
31,722 lineal feet of Macadamizing, equal to.....	6 $\frac{42}{8280}$ miles

Total number of miles improved in the city. 134 $\frac{4277}{8280}$ miles

These improvements are distributed in the three divisions of the city as follows:

NORTH DIVISION.

135,854 lineal feet of wooden block pavement, equal to	25 $\frac{3854}{5280}$ miles
908 lineal feet of stone pavement, equal to	$\frac{908}{5280}$ miles
6,666 lineal feet of cinderling, equal to	1 $\frac{386}{5280}$ miles
1,604 lineal feet of graveling, equal to	$\frac{1604}{5280}$ miles
3,049 lineal feet of Macadamizing, equal to	$\frac{3049}{5280}$ miles
Total number of miles.....	28 $\frac{241}{5280}$ miles

SOUTH DIVISION.

194,220 lineal feet of wooden block pavement, equal to	36 $\frac{4140}{5280}$ miles
4,163 lineal feet of stone pavement, equal to	$\frac{4163}{5280}$ miles
27,510 lineal feet of graveling, equal to	5 $\frac{900}{5280}$ miles
1,839 lineal feet of Macadamizing, equal to	$\frac{1839}{5280}$ miles
Total number of miles.....	43 $\frac{482}{5280}$ miles

WEST DIVISION.

253,257 lineal feet of wooden block pavement, equal to	47 $\frac{5997}{5280}$ miles
42,183 lineal feet of cinderling, equal to	7 $\frac{523}{5280}$ miles
13,920 lineal feet of graveling, equal to	2 $\frac{360}{5280}$ miles
26,834 lineal feet of Macadamizing, equal to	5 $\frac{434}{5280}$ miles
Total number of miles.....	63 $\frac{564}{5280}$ miles

The following list shows the total of assessments made in each year since 1861:

For the year ending April 1, 1862.....	\$ 42,635 49
For the year ending April 1, 1863.....	46,493 67
For the year ending April 1, 1864.....	389,169 31
For the year ending April 1, 1865.....	103,576 35
For the year ending April 1, 1866.....	802,574 56

For the year ending April 1, 1867.....	317,206 18
For the year ending April 1, 1868.....	1,354,436 48
For the year ending April 1, 1869	2,395,683 03
For the year ending April 1, 1870.....	2,836,852 48
For the year ending April 1, 1871.....	2,359,835 89
For the year ending April 1, 1872.....	62,222 25
For the year ending April 1, 1873	
For the year ending April 1, 1874.....	749,460 27
For the year ending April 1, 1875.....	723,254 42
For the nine months ending January 1, 1876...	60,585 72
For the year ending January 1, 1877.....	1,516,081 07
For the year ending January 1, 1878.....	124,498 48
For the year ending January 1, 1879.....	284,900 45
For the year ending January 1, 1880	588,963 43

Total for nineteen years..... \$14,758,429 53

Respectfully submitted,

H. J. JONES,

Superintendent of Special Assessments.

FINANCIAL STATEMENT.

To HON. CHAS. S. WALLER,

Commissioner of the Department of Public Works:

DEAR SIR—I herewith respectfully submit my report of the receipts and expenditures of the Department of Public Works, from January 1, 1879, to December 31, 1879, inclusive:

TRIAL BALANCE LEDGER, DEPARTMENT OF PUBLIC WORKS, DECEMBER 31, 1879.

	DR.	CR.
Water Works Water Fund.....	\$6,255,530 52	
Water Fund in hands of City		
Treasurer	501,414 83	
Water Works Income		\$10,334,655 35
General Taxes Water Fund.....		430,000 00
Water Loan Bonds 6 per cent...		622,000 00
" " " 7 per cent..		3,625,000 00
" " " Canceled ...		568,000 00
Water Loan Interest.....	4,036,596 11	
Water Works expense and re-		
pairs	4,608,158 83	
Duncan, Sherman & Co.....	16,065 00	
Water Works Stock.....	29,318 00	
American Exchange National		
Bank Coupon Account.....	132,172 06	
E. M. Johnson.....	500 00	
G. W. Williams.....		100 00
Water Tax Fund in hands of		
City Treasurer.....	4,950 59	
Amount carried forward.....	\$15,584,705 94	\$15,579,755 35

	Dr.	Cr.
Amount brought forward	\$15,584,705 94	\$15,579,755 35
Ogden, Sheldon & Co.....		2,767 43
Barrett, Todd & Cochran.....		250 00
John Tyrell		150 00
Wm. Graydon.....		250 00
S. J. Bushnell.....		250 00
I. R. Hitt.....		25 00
D. R. Dyche		50 00
J. B. Drake		150 00
J. A. Hamilton and E. N. Tailor		3,542 72
Rathborn, Sard & Co.....		300 00
Fuller, Warren & Co.....		250 00
C. J. L. Meyer.....		200 00
Peshtigo Co.....		300 00
Sidney Myers.....		250 00
Chicago Canal and Dock Co....		1,166 43
Sidney Myers.....		1,063 77
Water Works Water Tax Fund..	2,294,843 88	
General Taxes, Water Tax Fund		2,288,829 12
Sewerage Fund in hands of City		
Treasurer	93,403 25	
Sewerage Sinking Fund.....		56,111 05
Sewerage Sinking Fund in hands		
of City Treasurer	41,857 66	
Sewerage Loan Interest		900 03
Sewerage Surplus Account.....		46,478 17
American Exchange Nat'l Bank.	900 03	
Stock Account.....	2,110 00	
Galena & Chicago Union R. R..		382 55
Chicago, Burlington & Quincy		
R. R.....		6,744 01
House drains....		10,039 89
Repairs North Division Sewers.		1,462 47
" South " " ..		1,550 96
" West " " ..		2,888 95
Cleaning North " " ..		2,451 12
" South " " ..		1,014 58
Amount carried forward.....	\$18,017,820 76	\$18,009,573 60

	Dr.	Cr.
Amount brought forward.....	\$18,017,820 76	\$18,009,573 60
Cleaning West Division Sewers.....		2,250 63
Street intersections.....		3,447 93
Sewerage office expense.....		454 34
Sewerage proportional expense..		2,094 26
Sewerage Tax Fund in hands of		
City Treasurer.....	214,072 03	
Sewers, North Division.....	1,065,435 87	
" South " 	1,433,158 95	
" West " 	2,620,587 84	
Sewerage advances	35,222 50	
Sewerage loan bonds, 6 per cent.		80,000 00
" " " 7 per cent.		2,543,000 00
" " " canceled...		377,000 00
General taxes, Sewerage Tax Fund		2,469,708 89
Sewerage covers, wood.....	1,346 10	
" " iron.....	6,303 82	
" pipe	11,231 22	
" brick.....	5,323 48	
" cement.....		1,113 80
Interest on temporary loans....		6,813 63
S. Lynd, Treas'r Sewerage Com-		
missioners.....	109,245 48	
D. Coughlin.....	1,561 51	
B. McMahon		200 00
E. N. Tailor and J. A. Hamilton		15,596 77
A. Jacobson and P. Tallman....		2,000 00
A. Jacobson.....		2,000 00
C. A. Gregory.....		4,000 00
R. DeBaptiste		15 00
F. Kneeland		31 25
H. Greenebaum, Treasurer.....		4,500 00
A. A. Dewey		235 00
C. W. Rigdon.....		1,482 50
G. E. Adams.....		205 63
Chi., Mil. & St. Paul R. R. Co..		700 10
North Chicago City R. R. Co...		3,454 20
Amount carried forward.....	\$23,521,309 56	\$23,529,877 53

	Dr.	Cr.
Amount brought forward.....	\$23,521,309 56	\$23,529,877 53
O. G. Gibbs.....		28 50
M. R. Good.....		55 00
J. R. Payson.....		55 00
Chicago Malleable Iron Works..		663 55
Twelfth Street outlet.....	2,785 78	
Morgan Street outlet.....	1,036 02	
Twenty-second Street outlet....	4,415 49	
Augusta Street outlet.....	1,216 91	
P. D. Betticher.....	741 78	
Mich'l McNichols.....		1,175 51
M. Clarkson....	1,523 31	
John Lyons.....		1,442 44
P. McArdle.....	268 68	
Appropriation Fund in hands of City Treasurer.....	374,316 21	
North Division.....		32,029 79
South Division.....		37,031 95
West Division.....		49,718 23
Special assessments.....		3,223 21
City office expense.....		5,665 39
Public buildings.....		4,654 70
Sidewalks North Division.....		333 97
" South " 		1,198 79
" West " 		2,049 16
Union Square.....		400 60
Washington Square.....		117 20
Ellis Park.....	65 25	
Lake Park.....		1,967 07
Union Park.....		750 18
Jefferson Park.....		237 75
Vernon Park.....		265 52
Wicker Park.....		273 63
Campbell Park.....		100 00
Congress Park.....		214 00
Washington Street Tunnel.....		1,870 14
LaSalle Street Tunnel.....		329 74
Amount carried forward.....	\$23,907,678 99	\$23,675,728 55

	Dr.	Cr.
Amount brought forward	\$23,907,678 99	\$23,675,728 55
Public Hydrants.....		203 74
John Hise.....	308 12	
Warrant No. 480.....		308 12
City Proportional Expense.....		2,593 52
Public Benefits.		138,167 00
Chicago Harbor.....		16,663 59
Bridge Tender's Salaries.....		9,284 82
Bridge Department.....		6,917 15
Fullerton Avenue Bridge.....		452 50
Thirty-ninth Street Bridge.....		926 66
Kedzie Avenue Bridge.....		2,277 50
Permits.....		4,592 17
Eighteenth Street Viaduct.....		5,171 93
Sangamon Street Viaduct.....		30,725 12
Fullerton Avenue Conduit.....		17,656 64
Street signs.....		62 54
House numbers.....		9 42
Ogden ditch dam.....		475 00
Street lamps.....	4,228 86	
City Hall Fund in hands of City Treasurer	172,332 09	
McKinney & Doyle.....	3,600 00	
City Hall Appropriation.....		542,285 62
City Hall Miscellaneous Expense	20,473 71	
John Sackley.....	1,483 62	
Mortimer & Tapper.....	58,194 88	
P. J. Sexton.....	38,441 00	
John Angus.....	47,515 15	
Thomlinson & Reed	194,451 42	
Wm. McNeil & Son.....	5,793 75	
River Improvement Loan Interest		33,681 91
River Improvement Sinking Fund		37,881 02
River Improvement Sinking Fund in hands of Treasurer.....	37,881 02	
River Improvement Bonds, 7 per cent.....		2,611,000 00
Amount carried forward	\$24,492,382 61	\$27,137,064 52

FINANCIAL STATEMENT.

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	Dr.	Cr.
Amount brought forward.....	\$24,492,382 61	\$27,137,064 52
River Improvement Bonds canceled		389,000 00
River Improvement Certificate of Indebtedness.....		272,976 98
Cost of deepening Illinois and Michigan Canal.....	3,306,658 89	
	<u>\$27,799,041 50</u>	<u>\$27,799,041 50</u>

WATER FUND.

Statement of the receipts by the Department of Public Works, and detailed statement of expenditures from January 1st, 1879, to December 31st, 1879, inclusive:

RECEIPTS.

Received from Water Tax collected	\$922,011 26
Received from tapping pipes....	5,565 90
Received from letting on water...	1,043 95
Received for labor and material laying water pipe for private parties.....	20,185 56
Received for new meters put in use and labor setting same....	4,906 99
Received for sale of West Reservoir lot.....	5,000 00
Received for sale of brick, West Reservoir	1,000 00
Received for sale of iron, North Reservoir, on account.....	1,000 00
Received for labor at Water Works shops.....	1,353 61
Amount carried forward.....	<u>\$962,067 27</u>

	Dr.	Cr.
Amount brought forward	\$962,067 27	
Received for old oil barrels.....	19 50	
Received for waste oil.....	15 00	
Received for scrap iron sold.....	171 60	
Received for coal from G. W. McMullin.....	539 72	
Received for pump at North Pumping Works.....	500 00	
Received for 5 per cent. discount on July salaries.....	435 40	
Received for salary overpaid, re- funded	17 07	
Received for rent lot North Pumping Works.....	15 00	
Total receipts.....		\$963,780 56

EXPENDITURES.

ADDITION TO WATER WORKS.

DISTRIBUTING PIPES AND SUPPLY MAINS LAID.	Cash Payments	True Cost.
For cast iron water pipe \$68,544 82		
Labor laying pipe..... 41,208 74		
Special Castings..... 6,978 29		
Cement for hydrant ba- sins..... 2,123 81		
Brick for hydrant basins 3,466 55		
Lead for laying pipe.... 4,974 29		
Lumber..... 2,021 16		
Horse feed..... 182 52		
One scale..... 125 00		
Saw dust..... 170 69		
Refunded money adv'ced for laying water pipe 515 00		
Tools and hardware.... 193 90		
Salary of draughtsman.. 367 15		
Am't carried forward.\$130,871 92		

	Cash Payments.	True Cost.
Am't brought forward..	\$130,871 92	
Rebates on money ad- v'ced for private work	557 95	
Nails.....	145 56	
Sand.....	312 85	
Gasket.....	259 27	
Plumbing.....	338 91	
Sewer pipe.....	329 80	
Lanterns and repairs...	51 50	
Felting	41 25	
Repairing harnesses....	20 35	
Repairing tools.....	88 28	
Rent of barn.....	24 00	
Stationery	18 25	
Tracing paper.....	19 25	
Repairing gauge.....	4 50	
Oil	70 16	
Picks and handles.....	32 00	
Horse shoeing.....	31 13	
Damages	69 75	
		\$133,286 68
Add—		
For making hydrants and stop cocks at shops in 1879.....	\$13,314 45	
For pipe-layers tools made at shops.....	435 43	
		\$13,749 88
Deduct—		
Amount rec'd for labor and material, scrap iron, etc.....	\$20,185 56	
Amount rec'd for iron, North Reservoir.....	1,000 00	
Amount rec'd for brick, West Reservoir.....	1,000 00	
Am't carried forward.	\$22,185 56	\$133,286 68

		Cash Payments.	True Cost.
Am't brought forward..	\$22,185 56	\$133,286 68	
Amount rec'd for sale of West Reservoir lot...	5,000 00		
	<u>\$27,185 56</u>		
Less as above	13,749 88		
	<u>\$13,435 68</u>		\$119,851 00
Total additions to Wa- ter Works		\$133,286 68	\$119,851 00

WORKING EXPENSES AND REPAIRS.

		Cash Payments.	True Cost.
NORTH PUMPING WORKS AND SHOPS.			
Paid for coal	\$49,134 07		
Labor	30,220 66		
Castings	8,322 76		
Gas	1,725 77		
Steam fitting	1,392 32		
Horse feed	636 36		
Horse shoeing	101 80		
Lumber	181 46		
Hardware	170 88		
Iron bolts and washers..	890 46		
Packing and gasket.....	459 14		
Oil	567 67		
Trees	165 00		
Rubber packing, etc.....	270 21		
One pump	405 00		
Lead	239 50		
Painting shop	257 00		
Masonry work	5 50		
Canvass	10 20		
Gauge glasses	6 24		
Compound	4 80		
Rope	7 73		
Brimstone	32 75		
Repairing gauge	26 45		
Am't carried forward..	\$95,233 73		

FINANCIAL STATEMENT.

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	Cash Payments.	True Cost.
Am't brought forward ..	\$95,233 73	
Repairing harness.....	35 65	
Hauling ashes	159 37	
Telegraph material	20 00	
Soap.....	43 60	
Brooms	10 75	
Glazing.....	12 00	
Asphalt covering	43 33	
Cement.....	17 60	
Lanterns and repairs....	14 20	
Repairing roof.....	57 13	
Lawn mower.....	14 66	
Brick.....	32 50	
Bedding	49 15	
Ice	16 00	
Repairing buggy.....	16 00	
		\$95,775 67
DEDUCT—		
For hydrants and stop cocks made at shop in in 1879	\$13,314 45	
Received from scrap iron sold	171 60	
Received from sale of pump.....	500 00	
Received for labor from Street and Sewerage Department	381 63	
Received for rent and heating from Fire Department	971 98	
Received for rent of lot	15 00	
Received for labor for Lake Crib.....	73 25	
Received for making pipe layers' tools ...	435 43	
Am't carried forward.	\$15,863 34	\$95,775 67

		Cash Payments.	True Cost.
Am't brought forward..	\$15,863 34	\$95,775 67	
Received for repairing hydrants	562 74		
Received for repairing tappers' tools.....	103 97		
For stable expenses for tappers' horses	598 82		
For stable expenses for meter horse	190 88		
Labor at shops for Meter Department	56 16		
Labor at shops for West Pumping Works	125 82		
Labor at shops on shut- off tools.....	34 19		
	\$17,535 92		\$78,239 75

WEST PUMPING WORKS.

Paid for coal.....	\$22,796 54		
Labor.....	19,587 02		
Gas, two years.....	3,499 40		
Oil.....	1,596 95		
Iron and bolts and labor for repairs.....:	1,031 56		
One pump.....	495 00		
Packing and waste	495 79		
Compound	127 60		
Hardware	195 25		
Lumber.....	180 41		
Steam fitting	542 75		
Fire brick and clay	288 45		
Brooms	31 50		
Repairing clocks	2 00		
One meter	22 50		
Gauge glasses.....	3 47		
Cement	24 50		
Castings	16 70		
Am't carried forward.	\$50,937 39	\$95,775 67	\$78,239 75

FINANCIAL STATEMENT.

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		Cash Payments.	True Cost.
Am't brought forward..	\$50,937 39	\$95,775 67	\$78,239 75
Soap.....	81 35		
Emery glass	2 00		
Sand	15 00		
Rope	30 00		
Telegraph material....	36 35		
Repairing gauge	4 00		
Ice	24 50		
Rubber	12 15		
Plumbing	6 95		
Lanterns and lamps....	5 15		
Glazing.....	9 00		
		\$51,163 84	

ADD—

For labor at shops in 1879	\$125 82
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DEDUCT—

Amount received for oil barrels.....	15 00		
Amount rece'd for waste oil	15 00		
Amount received for old barrels.....	4 50		
Amount receiv'd for coal to G. W. McMullin..	539 72		
		\$ 574 22	
Less as above	125 82		
		\$ 448 40	\$50,715 44

WATER OFFICE EXPENSE AND-
SALARIES.

Salaries in Water Office,	\$52,976 19		
Printing	812 40		
Stationery.....	451 33		
Am't carried forward.	\$54,239 92	\$146,939 51	\$128,955 19

		Cash Payments.	True Cost.
Am't brought forward..	\$15,863 34	\$95,775 67	
Received for repairing hydrants	562 74		
Received for repairing tappers' tools.....	103 97		
For stable expenses for tappers' horses	598 82		
For stable expenses for meter horse	190 88		
Labor at shops for Meter Department	56 16		
Labor at shops for West Pumping Works	125 82		
Labor at shops on shut- off tools.....	34 19		
	\$17,535 92		\$78,239 75

WEST PUMPING WORKS.

Paid for coal.....	\$22,796 54
Labor.....	19,587 02
Gas, two years.....	3,499 40
Oil.....	1,596 95
Iron and bolts and labor for repairs.....	1,031 56
One pump.....	495 00
Packing and waste	495 79
Compound	127 60
Hardware	195 25
Lumber.....	180 41
Steam fitting	542 75
Fire brick and clay	288 45
Brooms	31 50
Repairing clocks	2 00
One meter	22 50
Gauge glasses.....	3 47
Cement	24 50
Castings	16 70

Am't carried forward.	\$50,937 39	\$95,775 67
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FINANCIAL STATEMENT.

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		Cash Payments.	True Cost.
Am't brought forward..	\$1,914 97	\$205,377 14	\$128,955 19
Labor charged office expense transferred to Water Service cocks account	4,191 78		
	<u>\$ 6,106 75</u>		
Less as above	34 19		
	<u>\$ 6,072 56</u>		\$52,365 07

SALARIES.

For one-third salary of Commissioner.....	\$1,000 00		
For one-third salary of Secretary.....	666 64		
For one-third salary of Secretary's clerk.....	300 00		
For one-third salary of Book-keeper.....	733 32		
For one-third salary of assistant Book-keeper	533 32		
For one-third salary of Supt. Map Dep't.....	500 00		
For one-third salary of Supt. Streets.....	800 00		
For one-third salary of Clerk Street Dep't...	300 00		
Amount paid City Engineer.....	166 66		
Amount paid Ass't Engineer.....	150 00		
One-third salary of City Engineer's Clerk.....	400 00		
	<u></u>	\$5,549 94	\$5,549 94
Am't carried forward..		\$210,927 08	\$186,870 20

	Cash Payments.	True Cost.
Am't brought forward..	\$210,927 08	\$186,870 20

WATER MISCELLANEOUS EXPENSE.

For 2 bonds purchased.	\$2,000 00	
Labor during ice trouble in river, getting out tug boat.....	710 76	
Use of tug breaking ice.	1,485 00	
Powder blasting ice....	373 85	
Life-boat.....	100 00	
Repairi'g buildings dam- aged	74 02	
Painting buildings dam- aged	60 00	
Plaster'g buildings dam- aged	200 00	
Contract forfeit credited in error.....	200 00	
Oil	13 00	
Hardware	33 95	
Wire work for ice.....	12 50	
Reglazing.....	73 48	
Paving in front of Adams street water lot.....	504 68	
Refunded amt. advanced for hydrant wrenches.	30 00	
Sand.....	5 00	
Rope.....	1 92	
Plumbing	7 25	
		\$5,885 41

DEDUCT—

Amount received for let- ting on water	\$1,043 95	\$4,841 46
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WATER METERS.

Water meters and count- ers	\$5,335 95
Brass castings.....	2,409 41

Am't carried forward.	\$7,745 36	\$216,812 49	\$191,711 66
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FINANCIAL STATEMENT.

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		Cash Payments.	True Cost.
Am't brought forward..	\$7,745 36	\$216,812 49	\$191,711 66
Labor	1,257 40		
Lumber	615 73		
Plumbing	100 26		
Candles	34 56		
Horse feed	72 97		
Horse shoeing	46 63		
Hardware	123 67		
Packing	41 53		
Freight on meters.....	31 56		
Matches	16 50		
Horse blankets	16 00		
Oil	10 90		
Printing	3 50		
Repairing wagon.....	3 50		
Sealing wax	1 50		
Repairing lathe	1 75		
Glass.....	1 30		
		\$10,124 62	
ADD—			
For labor at shops in 1879.....	\$56 16		
For stable expense at shops in 1879.....	190 88		
For salary charged office expense transferred..	1,462 50		
For labor charged repairs transferred	6,566 50		
		\$8,276 04	
DEDUCT—			
Amount rec'd for meters and labor setting same.	4,906 99		
		\$3,369 05	\$13,493 67
Am't carried forward.		\$226,937 11	\$205,205 33

	Cash Payments.	True Cost.
Am't brought forward .	\$226,937 11	\$205,205 33
LAKE TUNNEL CRIB.		
Salary of crib keeper and labor repairing crib..	\$2,301 26	
Use of tug.....	1,429 00	
One boiler.....	547 00	
Steam fitting.....	220 14	
One engine.....	175 00	
Hoisting machinery....	53 00	
Belting.....	5 40	
Diving to examine crib.	275 00	
Rubber goods.....	87 87	
Lumber.....	46 67	
Coal.....	229 00	
Hardware.....	53 40	
Repairing fog bell.....	30 50	
Ice scoop.....	20 00	
Brushes, etc.....	26 70	
Lamps and oil.....	60 15	
Brick.....	64 85	
Board of men.....	59 20	
Telegraph material.....	34 25	
Iron.....	56 00	
Beef for men in time of ice trouble.....	14 00	
Bread for men in time of ice trouble.....	3 96	
Gaskets.....	2 43	
Matches.....	2 34	
Reglazing.....	1 55	
Mattresses.....	16 00	
Oars.....	2 35	
Rope and chain.....	71 24	
Cement.....	18 50	
Sand.....	7 50	
	5,914 26	
Am't carried forward.	\$232,851 37	\$205,205 33

FINANCIAL STATEMENT.

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	Cash Payments.	True Cost.
Am't brought forward..	\$232,851 37	\$205,205 33

ADD—

For labor at shops in		
1879.....	\$ 73 25	5,987 51

HYDRANTS.

Labor.....	\$17,384 27		
Lumber	1,284 26		
Brick.....	143 38		
Cement	112 32		
Coal	4 40		
Packing.....	49 52		
Engine and boiler	153 87		
Hardware	47 17		
Horse feed.....	73 50		
Oil and lamps.....	117 97		
Sawdust.....	105 00		
Felting	44 37		
Shoeing horse.....	17 25		
Salt	22 40		
Castings	19 89		
Pitch	6 40		
Smokestack	2 96		
Stonework	5 00		
		\$19,593 93	\$19,593 93

WATER WORKS INLET.

Rubber boots	\$ 16 50		
Washers	3 00		
Hardware	96 00		
Labor.....	20 00		
		\$ 135 50	\$ 135 50

WATER WORKS REPAIRS.

Labor.....	\$26,715 69		
Repairing holes opened to repair pipe	578 00		
Am't carried forward.	\$27,293 69	\$252,580 80	\$230,922 27

		Cash Payments.	True Cost.
Am't brought forward..	\$27,293 69	\$252,580 80	\$230,922 27
Lumber	278 46		
Hardware	126 04		
Brick	112 02		
Horse feed	32 25		
Rebate	23 25		
Plumbing	28 65		
Cement	68 92		
Paint and oil	21 00		
Steam fitting	39 57		
Castings	11 70		
Repairing harness	32 00		
Felting	20 80		
Sand	37 50		
Repairing wagon	13 60		
Coal	21 20		
Repairing scales	22 53		
Moving pipe press	25 00		
Repairing tools	35 40		
		\$28,243 58	

ADD—

For labor at shops in 1879	
Repairing hydrants and stop cocks	\$ 562 74

DEDUCT—

Labor charged Meter De- partment	6,566 50	
	\$ 6,003 76	\$22,239 82

WATER SERVICE COCKS.

Corporation taps	\$2,060 50	
Labor	244 00	
Water boxes	158 76	
Am't carried forward.	\$2,463 26	\$280,824 38 \$253,162 09

FINANCIAL STATEMENT.

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		Cash Payment.	True Cost.
Am't brought forward..	\$2,463 26	\$280,824 38	\$253,162 09
Shoeing horses.....	67 75		
Repairing wagons	47 06		
Solder	6 00		
Tools	5 60		
		2,589 67	
Add—			
Labor at shops in 1879.	\$ 103 97		
Stable expenses at shops in 1879	598 82		
Tappers' salaries trans- ferred from Water Of- fice Expense.....	4,191 78		
	\$4,894 57		
DEDUCT—			
Amount receiv'd for tap- ping pipes.....	5,565 90		
	671 33		1,918 34
Total operating expenses.		\$283,414 05	\$255,080 43

WATER WORKS INCOME.

	Cash Payments.	True Cost.
Income collected twice, refunded	\$ 355 95	\$ 355 95

WATER LOAN INTEREST.

	Cash Payments.	True Cost.
Remittance to American Exchange National Bank to pay July, 1879, interest.....	\$123,858 88	
Remittance to American Exchange National Bank to pay January, 1880, interest...	125,137 06	
Coupons paid by City Treasurer	42,665 00	
Interest on two bonds purchased.....	60 30	
	\$291,721 24	\$291,721 24

RECAPITULATION.

	Cash Payments.	True Cost.
Total additions brought forward ...	\$133,286 68	\$119,851 00
Total operating expenses brought forward	283,414 05	255,080 43
Total income refunded brought forward	355 95	355 95
Total water loan interest brought forward	291,721 24	291,721 24
Total expenditures	\$708,777 92	\$667,008 62

CONDENSED STATEMENT OF RECEIPTS AND EXPENDITURES.

	Cash Payments.	True Cost.
Total income from water rents	\$922,011	26
EXPENDITURES.		
Expense of running N.		
Pumping Works	\$78,239	75
Expense of running W.		
Pumping Works	50,715	44
Office expense and salaries	52,365	07
Salaries provided for by ordinance	5,549	94
Miscellaneous expense	4,841	46
Water meters	13,493	67
Lake Tunnel crib	5,987	51
Hydrants	19,593	93
Water Works inlet	135	50
Water Works repairs	22,239	82
Water service cocks	1,918	34
Water income refunded	355	95
Water loan interest	291,721	24
Total operating expense	547,157	62
Surplus after paying operating exp's	374,853	64
Amount paid out on water pipe extension	119,851	00
Surplus for 1879	\$255,002	64

SEWERAGE FUND.

Statement of the Receipts and Expenditures of the Sewerage Fund from January 1, 1879, to December 31, 1879, inclusive.

RECEIPTS.

Amount of appropriation by City Council.....	\$67,716 66	
Amount received from Sewerage Tax Fund	91,859 36	
Amount received from house drain permits.....	15,343 30	
Amount received from labor cleaning sewers	301 62	
Amount deducted on repair bill....	99 80	
Amount received for covers sold ...	31 55	
Total receipts		\$175,352 29

EXPENDITURES.

SEWERAGE LOAN INTEREST.

	Cash Payments.	True Cost.
Paid Merchants' Saving Loan and Trust Co. for January, 1879, interest	\$90,757 22	
Paid River Improvem't Fund its portion of Sewerage Tax for January, 1879, interest ..	90,020 00	
	\$180,777 22	\$180,777 22

STOCK ACCOUNT.

Tools purchased.....	\$665 42		
Lumber.....	266 67		
Changing covers pattern	121 60		
One scale	42 05		
"	20 00		
Am't carried forward.	\$1,115 74	\$180,777 22	\$180,777 22

FINANCIAL STATEMENT.

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		Cash Payments.	True Cost.
Am't brought forward..	\$1,115 74	\$180,777 22	\$180,777 22
Repairing scales	13 31		
Cement moulds.....	34 67		
Stone.....	11 85		
Rubber boots	44 60		
Lanterns and globes ...	12 95		
Labor.....	80 00		
Nails	16 05		
Hose	40 70		
Rope	67 42		
Repairing tools	88 26		
One stamp	11 00		
		\$1,536 55	

DEDUCT—

Amount transferred to sundry accounts for depreciation in tools .	\$ 1,259 25
Refunded on repair bill of Jarrett & Sherman.	99 80
	\$ 1,359 05

\$ 177 50

HOUSE DRAINS.

Salary of draughtsman.	\$1,335 63
Labor.....	5,498 33
Printing.....	40 75
Messenger.....	24 50
	\$6,899 21

DEDUCT—

Amount received for per- mits	\$15,343 30
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Am't carried forward.		\$189,212 98	\$180,954 72
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	Cash Payments.	True Cost.
Am't brought forward..	\$189,212 98	\$180,954 72

REPAIRS SEWERS NORTH DIVISION.

Labor	\$ 322 23	
Teaming	96 80	
Nails	12 50	
Tools	6 00	
		\$ 437 53

ADD—

For depreciation in tools.	\$ 100 00	\$ 537 53
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REPAIRS SEWERS SOUTH DIVISION.

Labor	\$1,129 55	
Teaming	174 34	
Nails	20 70	
Tools	6 00	
		\$1,330 59

ADD—

For depreciation in tools.	\$ 150 00
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DEDUCT—

Amount rec'd for covers.	31 55	
	\$ 118 45	\$1,449 04

REPAIRS SEWERS WEST DIVISION.

Labor	\$1,682 35	
Teaming	91 45	
Brick	152 00	
Nails	18 75	
Tools	16 50	
		\$1,961 05

ADD—

For depreciation in tools.	\$ 150 00	\$2,111 05
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Am't carried forward.	\$192,942 15	\$185,052 34
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FINANCIAL STATEMENT.

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	Cash Payments.	True Cost.
Am't brought forward .	\$192,942 15	\$185,052 34

CLEANING SEWERS NORTH DIVISION.

Labor	\$6,688 25	
Teaming	632 50	
Repairing wagon	26 13	
Candles	2 00	
		\$7,348 88

ADD—

For depreciation in tools.	\$ 200 00	\$7,548 88
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CLEANING SEWERS SOUTH DIVISION.

Labor	\$7,091 93	
Teaming	1,636 48	
Repairing wagon	26 13	
Candles, etc.	5 50	
		\$8,760 04

ADD—

For depreciation in tools.	\$ 300 00	
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DEDUCT—

Am't received for labor.	74 62	
	\$ 225 38	\$8,985 42

CLEANING SEWERS WEST DIVISION.

Labor	\$9,843 46	
Teaming	2,509 77	
Repairing wagon	26 14	
Lumber	8 75	
Candles	2 00	
		\$12,390 12

ADD—

For depreciation in tools.	\$ 359 25	\$12,749 37
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Am't carried forward.	\$221,441 19	\$214,336 01
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	Cash Payments.	True Cost.
Am't brought forward..	\$221,441 19	\$214,336 01

VENTILATING SEWERS.

Labor.....	\$2,962 72	
Teaming	467 95	
Stone.....	135 04	
Iron work.....	3 00	
	\$3,568 71	\$3,568 71

STREET INTERSECTIONS.

Labor.....	\$2,535 24	
Teaming	551 37	
Repairing	123 75	
	\$3,210 36	

DEDUCT—

Am't received for labor. .	\$227 00	\$2,983 36
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SEWERAGE OFFICE EXPENSE.

Directories.	\$ 8 33	
Stationery.....	352 52	
Printing	226 33	
Printing third annual report	229 00	
Advertising	270 90	
Cash items for postage stamps, etc.....	283 01	
Lithographing	91 60	
Matting	56 00	
One map.	15 60	
Furniture	10 00	
Hardware	2 37	
	\$1,545 56	\$1,545 66
Am't carried forward.	\$229,765 92	\$222,433 74

FINANCIAL STATEMENT.

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	Cash Payments.	True Cost.
Am't brought forward..	\$229,765 92	\$222,433 74

SALARIES PROVIDED FOR BY
ORDINANCE.

$\frac{1}{8}$ salary of Commis'ner.	\$1,102 26	
$\frac{1}{8}$ salary of Secretary ...	649 98	
$\frac{1}{8}$ salary of Sec'y's clerk.	296 25	
$\frac{1}{8}$ salary of Book-keeper.	714 99	
$\frac{1}{8}$ salary of Ass't "	519 99	
$\frac{1}{8}$ salary of Superintend't map department	487 50	
$\frac{1}{8}$ salary of City Engi- neer's clerk.....	392 09	
$\frac{1}{8}$ salary of Superintend't streets clerk	296 25	
Paid City Engineer....	145 56	
Paid Supt. of streets...	162 50	
Paid Supt. of sewerage.	545 03	
	\$5,312 40	\$5,312 40
Total expenditures	\$235,078 32	\$227,746 14

SEWERAGE TAX FUND.

Statement of the Receipts and Expenditures of the Department of Public Works from January 1, 1879, to December 31, 1879, inclusive.

RECEIPTS.

Am't of Approp'n by City Council.	\$250,000 00
Received from private parties for constructing sewers.....	4,500 00
Received from pipe sold	8,737 48
Received from brick sold.....	2,599 27
Received from covers sold.....	3,646 00
Received from cement sold.....	389 25
Received from labor.....	324 70
Total receipts	\$270,196 70

EXPENDITURES.

SEWERS NORTH DIVISION.		Cash Payments.	True Cost.
Paid P. Kelly, constr'ng sewer	\$ 49 28		
N. C. R. R. C., advance refunded	562 75		
Sewerage Fund, permits	30 00		
		\$642 03	
ADD—			
For sundry sewers constr'd, includ'g brick, pipe and covers, and catch basins built....	\$51,244 17		
			\$51,886 20
SEWERS SOUTH DIVISION.			
Sewerage permits		\$ 52 50	
ADD—			
For sundry sewers constr'd, includ'g brick, pipe and covers, and catch basins built....	\$75,269 01		
			\$75,321 51
SEWERS WEST DIVISION.			
Paid for constructing sewers.....		\$2,894 74	
ADD—			
For sundry sewers constr'd, includ'g brick, pipe and covers, and catch basins built....	\$113,190 29		
			\$116,085 03
Am't carried forward.		\$3,589 27	\$243,292 74

FINANCIAL STATEMENT.

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	Cash Payments.	True Cost.
Am't brought forward..	\$3,589 27	\$243,292 74

SEWERAGE COVERS, WOOD.

Lumber	\$2,277 26	
Labor	1,512 47	
Nails	202 75	
Advertising	24 00	
		\$4,016 48

DEDUCT—

Amount received from sewerage repairs	\$3,646 00
Amount transferred to sundry sewers	4,378 01
	\$8,024 01

SEWERAGE COVERS, IRON.

Iron covers purchased..	\$15,463 75
Labor	233 50
	\$15,697 25

DEDUCT—

Amount transferred to sundry sewers	\$9,393 43	\$6,303 82
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SEWERAGE PIPE.

Paid Akron Sewer Pipe Co., pipe	\$16,304 85	
P'd Buckeye Sewer Pipe Co., pipe	15,282 58	
Paid Potomac Terra Cotta Co., pipe	24,557 03	
Labor	2,671 12	
Advertising	99 00	
Sewer pipe	17 50	
		\$58,932 08
Am't carried forward.	\$82,235 08	\$249,596 56

	Cash Payments.	True Cost.
Am't brought forward..	\$82,235 08	\$249,596 56

DEDUCT—

Pipe cha'd house drains.	\$8,737 48
Amount transferred to sundry sewers	52,236 53
	\$60,974 01

SEWERAGE BRICK.

Brick purchased.....	\$39,323 26
Labor.....	4,083 33
Lumber	3 50
	\$43,415 09

DEDUCT—

Am't received for brick sold Water Depart ..	\$1,200 00	
Am't received for brick sold Fullerton av. con.	3 50	
Am't received for brick sold sewerage repairs.	1,395 77	
Amount transferred to sundry sewers	38,682 11	
	\$41,281 38	\$2,133 71

SEWERAGE CEMENT.

Cement purchased.....	\$15,762 78
Labor	203 25
Use of horse for Insp'r.	112 75
Use of buggy for “ .	37 74
Advertising	67 63
Wire screens	7 20
	\$16,191 35

Am't carried forward.	\$141,841 52	\$251,730 27
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FINANCIAL STATEMENT.

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	Cash Payments.	True Cost.
Am't brought forward..	\$141,841 52	\$251,730 27

DEDUCT—

Amount received for cement sold.....	\$ 176 80	
Amount transferred to sewerage repairs	212 45	
Amount transferred to sundry sewers	15,445 11	
	<u>\$15,834 36</u>	\$ 356 99

SAND ACCOUNT.

Sand purchased	\$ 750 00
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DEDUCT—

Amount transferred to sewers W. Division..	\$ 750 00
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TWELFTH STREET OUTLET.

Labor	\$1,565,91	
Cement	384 00	
Stone	157 50	
Cinders	205 50	
Lumber	102 66	
Filling	93 75	
Sand	45 75	
Iron	18 41	
One pump	2 50	
Bolts	23 35	
Castings	77 04	
Rope	18 49	
Canvass	37 28	
	<u> </u>	\$2,732 14

ADD—

For teaming done by contract.....	\$ 53 64	\$2,785 78
Am't carried forward.	\$145,323 66	\$254,873 04

	Cash Payments.	True Cost.
Am't brought forward..	\$145,323 66	\$254,873 04
MORGAN STREET OUTLET.		
Labor.....	\$ 795 18	
Stonework.....	176 21	
Lumber.....	41 62	
Nails.....	11 25	
Bolts.....	7 26	
Oakum.....	4 50	
	\$1,036 02	\$1,036 02
AUGUSTA STREET OUTLET.		
Labor.....	\$ 756 18	
Stone.....	186 47	
Driving piles.....	114 25	
Lumber.....	28 01	
	\$1,084 91	
Add—		
For brick used.....	\$132 00	\$1,216 91
TWENTY-SECOND STREET OUTLET.		
Labor.....	\$2,167 27	
Water pipe.....	1,268 79	
Stone.....	265 95	
Castings.....	164 09	
Sewer trap.....	133 38	
Lumber.....	185 47	
Cement.....	90 00	
Diving.....	20 00	
Sand.....	20 00	
Bolts.....	18 27	
Nails.....	17 32	
Use of tools.....	30 00	
Oakum.....	13 72	
Buckets.....	3 50	
Iron.....	1 21	
Lead.....	6 85	
Rope.....	9 67	
	\$4,415 49	\$4,415 49
Am't carried forward.	\$151,860 08	\$261,541 46

FINANCIAL STATEMENT.

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	Cash Payments.	True Cost.
Am't brought forward..	\$151,860 08	\$261,541 46

SEWERAGE MISCELLANEOUS
EXPENSE.

Salary of Engineers ...	\$1,875 65	
Plumbing	1,422 22	
Labor.....	156 35	
Advertising	138 00	
Printing	142 50	
Use of horse.....	57 50	
Lumber.....	24 04	
Repairing tools	42 90	
Oil and salt	9 90	
Tape lines	28 80	
Maps	3 75	
		\$3,901 61

DEDUCT—

Amount transferred to sewerage repairs	\$ 230 00
Amount transferred to sewers, 3 divisions...	3,765 61
	\$3,995 61

ENGINEERS AND INSPECTORS.

Salary of Superintende't of Sewerage	\$ 624 99	
Salary of Clerk	1,143 08	
Salary of Assistant En- gineers.....	3,341 25	
Salary of Inspectors ...	8,963 46	
		\$14,072 78

DEDUCT—

Amount transferred to sewers, 3 divisions...	\$14,072 78	
Am't carried forward.	\$169,834 47	\$261,541 46

	Cash Payments.	True Cost.
Am't brought forward..	\$169,834 47	\$261,541 46
LABOR ACCOUNT.		
Labor building catch basins and wing sewers.	\$16,089 07	
DEDUCT—		
Amount transferred to sewers, 3 divisions...	\$16,089 07	
WARD 6.		
Plumbing	\$ 29 35	
DEDUCT—		
Amount transferred to sewers W. Division..	\$ 29 35	
P. D. BETTICHER.		
Paid T. Nash for finishing contract.....	\$ 349 02	
Sand	45 00	
	\$ 394 02	\$ 394 02
T. SCANLON, CONTRACTOR.		
Paid him for constructing sundry sewers...	\$7,617 92	
DEDUCT—		
Amount transferred to sundry sewers	\$7,617 92	
MICHAEL McNICHOLS, CONTRACTOR.		
Paid him for constructing sundry sewers...	\$6,661 24	
DEDUCT—		
Amount transferred to sundry sewers	\$7,836 75	
Am't carried forward.		
	\$200,626 07	\$261,935 48

FINANCIAL STATEMENT.

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	Cash Payments.	True Cost.
Am't brought forward..	\$200,626 07	\$261,935 48

M. CLARKSON, CONTRACTOR.

Paid him for construct- ing sundry sewers ...	\$14,738 88	
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DEDUCT—

Amount transferred to sundry sewers	\$13,215 57	\$1,523 31
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J. F. & M. C. DUFFY, CONTRACTORS.

Paid them for construct- ing sundry sewers ...	\$6,783 69	
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DEDUCT—

Amount transferred to sundry sewers	\$6,783 69	
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M. HALLINAN, CONTRACTOR.

Paid him for construct- ing sundry sewers ...	\$4,854 77	
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DEDUCT—

Amount transferred to sundry sewers	\$4,854 77	
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MARTIN McNICHOLS, CONTRACTOR.

Paid him for construct- ing sundry sewers...	\$3,475 24	
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DEDUCT—

Amount transferred to sundry sewers	\$3,475 24	
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P. KELLY, CONTRACTOR.

Sewerage fund, cleaning sewer.....	\$ 68 50	
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Am't carried forward.	\$230,547 15	\$263,458 79
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	Cash Payments.	True Cost.
Am't brought forward..	\$230,547 15	\$263,458 79
DEDUCT—		
Amount transferred to sundry sewers	\$ 68 50	
JOHN DUFFY, CONTRACTOR.		
Cleaning sewer	\$ 6 12	
DEDUCT—		
Amount transferred to sewers W. Division .	\$ 6 12	
JOHN McNICHOLS, CONTRACTOR.		
Paid him for construct- ing sundry sewers ...	\$3,002 26	
DEDUCT—		
Amount transferred to sundry sewers.....	\$3,002 26	
JOHN LYONS, CONTRACTOR.		
Paid him for construct- ing sundry sewers...	\$8,723 93	
DEDUCT—		
Amount transferred to sundry sewers.....	\$10,166 37	
THOS. DAKIN, CONTRACTOR.		
Paid him for sewerage teaming.....	\$3,167 31	
DEDUCT—		
Amount transferred to sewers, 3 divisions...	\$3,167 31	
Am't carried forward.	\$245,446 77	\$263,458 79

FINANCIAL STATEMENT.

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	Cash Payments.	True Cost.
Am't brought forward..	\$245,446 77	\$263,458 79

P. McARDLE.

Paid him for construct- ing sundry sewers...	\$4,013 80	
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DEDUCT—

Amount transferred to sundry sewers.....	\$3,745 12	\$268 68
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T. McNICHOLS, CONTRACTOR.

Paid him for construct- ing sundry sewers...	\$7,886 16	
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DEDUCT—

Amount transferred to sundry sewers.....	\$7,886 16	
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J. & J. SACKLEY, CONTRACTORS.

Paid them for construct- ing sundry sewers....	\$5,582 08	
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DEDUCT—

Amount transferred to sundry sewers.....	\$5,582 08	
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E. LANGAN, CONTRACTOR.

Paid him for construct- ing sewer	\$1,295 50	
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DEDUCT—

Amount transferred to Clybourne Av. sewer.	\$1,295 50	
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Am't carried forward.	\$264,224 31	\$263,727 47
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	Cash Payments.	True Cost.
Am't brought forward..	\$264,224 31	\$263,727 47

ADVANCES REFUNDED.

Paid O. B. Heaton, constructing sewer.....	\$ 428 75	
Paid C. B. Farwell, constructing sewer.....	265 00	
Paid J. E. Arveley, constructing sewer.....	264 00	
Paid C. W. Rigdon, constructing sewer.....	250 00	
Paid E. S. Dreyer, constructing sewer.....	530 56	
Paid S. W. Rawson, constructing sewer.....	30 00	
Paid J. A. Blongum, constructing sewer...	133 25	
Paid J. M. Johnson, constructing sewer.....	133 25	
Paid Z. Rosenlof, constructing sewer.....	133 25	
Paid L. Wrick, constructing sewer.....	133 25	
Paid J. O'Callaghan, constructing sewer.....	627 70	
Paid N. C. C. R. R. Co., constructing sewer...	3,740 02	
		\$6,669 03

DEDUCT—

Amount transferred to sewers, 3 divisions...	\$6,669 03		
Total expenditures sewage Tax Fund.....		\$270,893 34	\$263,727 47

APPROPRIATION FUND.

Statement of the Receipts and Expenditures of the Appropriation Fund from January 1, 1879, to December 31, 1879, inclusive.

RECEIPTS.

Amount of Appropriation by City Council.....	\$473,963 92	
Amount rece'd from Special Assessments for costs....	11,359 38	
Amount received from Pennsylvania R. R. for Eighteenth st. viaduct..	14,000 00	
Amount received from Pennsylvania R. R. for lamps.....	14 75	
Amount received from Cook County for rent Old City Hall	3,600 00	
Amount received from Cook County for heating Old City Hall	1,467 56	
Amount received for repaving.....	2,156 62	
Amount received for repairs of State street viaduct.....	400 00	
Amount received for contract forfeit dredging.....	200 00	
Amount received for contract forfeit Fullerton avenue conduit.....	200 00	
Amount received for street lamps broken	146 35	
Amount received for damages to bridges	181 40	
Amount received for sand sold	30 80	
Amount received for scrap iron sold.	20 33	
Amount received for labor at Fullerton avenue conduit	48 76	
Amount received for house numbers.	11 50	
Total receipts.....		\$507,801 37

EXPENDITURES.

NORTH DIVISION STREETS.

	Cash Payments.	True Cost.
Paid C. T. Hotchkiss,		
cleaning imp. streets. \$	4,389	44
Labor cleaning and re-		
pairing streets	16,759	39
Paving blocks.....	877	29
Lumber.....	604	74
Nails	148	45
Hardware and tools....	24	80
Gravel.....	136	67
Cinders	50	00
Rent of lumber lot	25	00
Repairing tools	17	00
	<u>\$23,032</u>	78

DEDUCT—

Amount received for re-		
paving	\$140	00
Amount received for fill-		
ing.....	82	50
	<u>\$ 522</u>	50
		\$22,510 28

SOUTH DIVISION STREETS.

Paid C. T. Hotchkiss,			
cleaning imp. streets. \$	7,830	08	
Labor cleaning and re-			
pairing streets	26,675	05	
Paving blocks.....	1,095	50	
Lumber	2,096	24	
Nails	270	05	
Hardware and tools....	104	00	
Gravel	183	15	
Cinders	202	75	
Spawls.....	70	20	
	<u>\$38,527</u>	02	
Am't carried forward.	\$23,032	78	\$22,510 28

FINANCIAL STATEMENT.

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		Cash Payments.	True Cost.
Am't brought forward..	\$38,527 02	\$23,032 78	\$22,510 28
One plow	20 00		
Horse keeping	30 00		
Mason work	50 00		
Repairing tools	38 40		
Printing	20 00		
Advertising	15 60		
		\$38,701 02	

DEDUCT—

Amount received for re-		
paving	\$ 513	\$38,188 02

WEST DIVISION STREETS

Paid C. T. Hotchkiss,		
cleaning imp. streets.	\$ 7,668 40	
Labor cleaning and re-		
pairing streets	45,041 75	
Paving blocks	2,488 10	
Lumber.....	4,052 04	
Nails	506 45	
Hardware and tools....	71 56	
Spawls.....	634 44	
Gravel	169 87	
Repairing Canal street.	186 90	
Keeping horse	60 00	
Repairing tools	63 10	
Printing	50 65	
Repairing buggy.....	35 00	
Advertising	125 79	
Piles	100 00	
Cinders	27 90	
Rent of lumber lot	50 00	
Brooms ..	8 50	
		\$61,340 45

DEDUCT—

Am't rec'd for repaving.	\$1,221 62	\$60,118 83
Am't carried forward.		
	\$123,074 25	\$120,817 13

	Cash Payments.	True Cost.
Am't brought forward.	\$123,074 25	\$120,817 13

SIDEWALKS NORTH DIVISION.

Salary of Inspector....	\$ 905 01		
Constructing walk	29 96		
		\$ 934 97	\$ 934 97

SIDEWALKS SOUTH DIVISION.

Salary of Inspectors....	\$1,029 12		
Constructing walk.	121 62		
		\$1,150 74	\$1,150 74

SIDEWALKS WEST DIVISION.

Salary of Inspectors....	\$1,661 10		
Constructing walk.....	43 90		
Advertising	34 80		
Printing	10 50		
		\$1,750 30	\$1,750 30

SPECIAL ASSESSMENT EXPENSE.

Court costs, Special Com- missioners and witness fees in court.....	\$5,546 35		
Advertising	3,966 23		
Stationery	224 40		
Clerk hire.....	277 75		
Postage stamps.....	100 00		
Examining buildings to be condemned.....	100 00		
Printing.....	21 25		
One map.....	12 00		
Hardware.....	2 50		
One atlas.....	50 00		
		\$10,300 48	

DEDUCT—

Amount received from special assessments...	\$11,359 38		
Am't carried forward.		\$137,210 74	\$124,653 14

FINANCIAL STATEMENT.

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	Cash Payments.	True Cost.
Am't brought forward .	\$137,210 74	\$124,653 14

OFFICE EXPENSE AND SALARIES.

$\frac{1}{8}$ salary of Commiss'r..	\$1,140 00		
$\frac{1}{8}$ salary of Secretary...	633 32		
$\frac{1}{8}$ salary of Sec'y's Clerk.	253 52		
$\frac{1}{8}$ salary of Book-keeper	696 68		
$\frac{1}{8}$ salary of Ass't Book-keeper	506 68		
$\frac{1}{8}$ salary of City Engin'r	950 00		
$\frac{1}{8}$ salary of City Engineer's Clerk.....	380 00		
$\frac{1}{8}$ salary of Supt. Map Department	475 00		
$\frac{1}{8}$ salary of Supt. Street Department Clerk...	241 33		
Salary of Supt. Special Assessment Dep't....	2,437 49		
Salary of Attorney Special Assessment Dep't	1,755 00		
Salary of Special Assessment Clerks.....	4,258 51		
Salary of Ass't Engin'rs	2,813 70		
Salary of Assistant to Engineers	1,557 09		
Salary of Draughtsman	900 00		
Salary of office Clerk...	57 39		
Stationery.....	428 83		
Printing.....	581 59		
Advertising	292 90		
Lithographing.....	91 60		
Police badges.....	20 00		
Matting	24 00		
Cash items paid by cash'r	269 36		
		\$20,763 99	\$20,763 99
Am't carried forward..		\$157,974 73	\$145,417 13

	Cash Payments.	True Cost.
Am't brought forward .	\$157,974 73	\$145,417 13

OLD CITY HALL.

Salary of Engineer and Fireman.....	\$1,800 00
Salary of Watchman and cleaners	2,400 00
Labor repairing building	958 70
Coal	2,352 54
Gas	2,994 08
Painting and Calcimin'g	794 64
Ice used.....	212 50
Carpets and matting...	133 65
Repairing boiler.....	462 59
Boiler tools.....	45 50
Compound for boiler...	21 00
Grate bars for boiler...	40 64
Hardware ..	142 75
Lumber	263 10
Street sprinkling.....	191 00
Furniture.....	124 75
Plumbing and gas fitting	178 23
Dusters and brushes...	59 39
Curtains.....	24 75
Awnings.....	31 50
Brooms, pails, matches.	48 44
Repairing roof.....	71 49
Steam fitting.....	145 80
Cleaning carpets.....	29 60
Advertising	60 30
Tin	10 35
Soap.....	40 50
Locks and keys	32 90
Plastering	48 99
Toweling.....	23 96
One ventilator.....	5 00

Am't carried forward. \$13,748 64 \$157,974 73 \$145,417 13

FINANCIAL STATEMENT.

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		Cash Payments.	True Cost.
Am't brought forward .	\$13,748 64	\$157,974 73	\$145,417 13
One stove	8 50		
Glasses and spittoons...	6 70		
		\$13,763 84	

DEDUCT—

Amount received for scrap iron.....	\$ 11 55		
Amount received from Cook County for rent	3,600 00.		
Amount received from Cook County for heat- ing	1,467 56		
	\$5,079 11		\$8,684 73

UNION SQUARE.

Labor.....	\$ 20 00		
Filling.....	108 90		
		\$128 90	

ADD—

For filling from street department.....	\$82 50		\$ 211 40
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WASHINGTON PARK.

Labor	\$491 50		
Lawn mower.....	18 00		
		\$509 50	\$509 50

ELLIS PARK.

Labor.....		\$474 00	\$474 00
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LAKE PARK.

Labor.....	\$1,461 56		
Repairing mower.....	7 68		
Hardware	1 42		
Am't carried forward.	\$1,470 66	\$172,850 97	\$155,296 76

		Cash Payments.	True Cost.
Am't brought forward .	\$1,470 66	\$172,850 97	\$155,296 76
Sprinkling in front of			
Park.....	180 00		
Hose.....	25 50		
Coal.....	12 00		
Lawn mowers.....	47 96		
		\$1,736 12	\$1,736 12

JEFFERSON PARK.

Labor.....	\$711 00		
Feed for fowls	12 72		
Hardware	2 25		
		\$725 97	\$725 97

UNION PARK.

Labor.....	\$1,015 34		
Animal feed.....	240 67		
Coal.....	8 40		
Gas	18 08		
Hardware.....	3 75		
Plumbing.....	31 10		
Repairing mower.....	17 78		
		\$1,335 12	\$1,335 12

VERNON PARK.

Labor.....	\$767 24		
Flowers	7 74		
Feed.....	4 00		
		\$ 778 98	\$ 778 98

WICKER PARK.

Labor	\$ 713 00		
Coal	2 00		
Oil can	25		
		\$ 715 25	\$ 715 25

Am't carried forward .	\$178,142 41	\$160,588 20
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FINANCIAL STATEMENT.

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	Cash Payments.	True Cost.
Am't brought forward .	\$178,142 41	\$160,588 20

CAMPBELL PARK.

Trees	\$ 70 00		
Painting fence	100 00		
Filling.....	33 00		
Hose	18 00		
		\$ 221 00	\$ 221 00

WASHINGTON STREET TUNNEL.

Salary of Engineer	\$ 888 71		
Cleaning tunnel.....	190 53		
Brooms	2 25		
Castings	14 36		
Repairing lamps	6 00		
Advertising	31 20		
Coal.....	73 80		
Alcohol	36 30		
Whitewashing	50 00		
Salt	17 20		
Plumbing	19 00		
Repairing engine.....	41 04		
Teaming	36 00		
Iron work.....	33 52		
Hardware	5 32		
		\$1,445 23	

DEDUCT—

Am't received for scrap iron sold.....	78		\$1,444 45
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LA SALLE STREET TUNNEL.

Salary of Engineer	\$ 813 78		
Cleaning tunnel.....	208 53		
Iron railing	450 00		
Repairing engine.....	108 70		
Iron work.....	70 98		
Advertising	74 40		
Whitewashing	50 00		
Am't carried forward.	\$1,776 39	\$179,808 64	\$162,253 65

		Cash Payments.	True Cost.
Am't brought forward .	\$1,776 39	\$179,808 64	\$162,253 65
Repairing lamp posts ..	15 00		
Alcohol	27 10		
Coal	56 60		
Oil	5 50		
Salt and brooms	3 05		
Hose	2 75		
		\$1,886 39	\$1,886 39

DRINKING HYDRANTS.

For one office fountain .	\$ 27 26		
For one street fountain.	11 00		
Repairing fountains ...	30 20		
Plumbing	17 90		
		\$ 86 36	\$ 86 36

PUBLIC BENEFITS.

Improv'g City's portion of streets that were newly paved	\$38,788 33		
Salary of Inspectors ...	2,002 89		
Building return walls..	316 90		
City's portion of alleys improved ...	491 32		
Advertising	21 60		
		\$41,621 04	

DEDUCT—

Amount received for in- specting	\$ 50 00		\$41,571 04
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CHICAGO HARBOR.

Dredging in the Chicago river	\$44,350 68		
Engineers and Assista'ts measuring dredging .	5,779 15		
Salary of Harbor Mast- ers	1,778 32		
Moving scow boat sunk.	105 00		
Building dock	46 60		
Am't carried forward.	\$52,059 75	\$223,402 43	\$205,797 44

FINANCIAL STATEMENT.

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		Cash Payments.	True Cost.
Am't brought forward .	\$52,059 75	\$223,402 43	\$205,797 44
Advertising	25 20		
Sounding lines and rods.	54 32		
Stationery	47 05		
Balances	8 50		
Hardware	17 71		
Rope and Oars.....	19 00		
Iron work.....	15 20		
Painting survey lines ..	13 98		
		\$52,260 71	\$52,260 71

BRIDGE DEPARTMENT REPAIRS.

Salary of Superintend't.	\$1,753 00		
Labor of carpenters....	8,172 90		
Lumber.....	4,041 72		
Painting bridges	2,331 30		
Iron work.....	853 57		
Rent lot at Erie street bridge	450 00		
Nails	398 03		
Oil	318 85		
Use of tug	247 50		
Driving piles	279 82		
Castings	186 68		
Coal.....	466 90		
Hardware	114 35		
Advertising	122 46		
Damage to vessels.....	132 10		
Repairing roof of bridge house.....	7 00		
Wheel barrows.....	14 00		
Rope and oars	73 68		
Lanterns and repairs...	88 62		
Brooms	63 56		
Repairing scow	83 21		
Clocks and repairs.....	24 75		
Stone work.....	60 29		
Am't carried forward.	\$20,284 29	\$275,663 14	\$258,058 15

		Cash Payments.	True Cost.
Am't brought forward .	\$20,284 29	\$275,663 14	\$258,058 15
Stoves and repairs	49 10		
Oakum	23 30		
Piles	96 00		
Frames	8 04		
Lamps	7 50		
Oil cans	6 75		
Masonry	9 00		
Bridge balls	14 00		
Printing	6 00		
Shovels	6 75		
		\$20,510 73	

DEDUCT—

Am't received for damage to bridges	\$ 113 40		
Amount received from C. & N. W. R. R. for repairs of State street viaduct	400 00		
		\$ 513 40	\$19,997 33

BRIDGE TENDERS SALARIES.

Amount paid for tending bridges	\$38 230 08	\$38,230 08
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FULLERTON AVENUE BRIDGE.

Paid J. W. Savin & Co., final estimate	\$1,022 50		
Paid for Inspector	70 00		
		\$1,092 50	\$1,092 50

KEDZIE AVENUE BRIDGE.

Paid Massillon Bridge Co., estimate No. 1..	\$ 722 50	\$ 722 50
Am't carried forward.	\$336,218 95	\$318,100 56

FINANCIAL STATEMENT.

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	Cash Payments.	True Cost.
Am't brought forward .	\$336,218 95	\$318,100 56

EIGHTEENTH STREET VIADUCT.

Paid Keystone Bridge Co.....	\$6,194 00		
P'd Jos. Clowry, mason contractor	5,611 51		
Salary of Inspector....	187 50		
Building wall.....	340 25		
Raising building	2,000 00		
Labor.....	65 00		
		\$14,398 26	

DEDUCT—

Amount received from Penn. R. R. Co.....	\$14,000 00		
Amount received from Bridge Co. for lamps.	14 75		
		\$14,014 75	\$ 383 51

SANGAMON STREET VIADUCT.

Advertising	\$ 34 80		
Lithographing.....	9 50	\$ 44 30	\$ 44 30

FULLERTON AVENUE CONDUIT.

Paid for engine to H. & F. Blandy.....	\$14,000 00		
Paid T. E. Courtney, const'g engine house.	24,086 03		
Labor.....	3,133 60		
Cleaning conduit.....	2,038 50		
Water gates	5,350 00		
Paid A. N. Fullerton for land	4,625 00		
Salary of Superintend't of Construction	1,155 00		
One pump	510 98		
Am't carried forward.	\$54,899 11	\$350,661 51	\$318,528 37

		Cash Payments.	True Cost.
Am't brought forward .	\$54,899 11	\$350,661 51	\$318,528 37
Coal.....	862 14		
Dredging	204 00		
Paid T. E. Courtney, ex-			
tra labor	493 65		
Iron work.....	225 28		
Lumber.....	203 71		
Hardware	153 11		
One meter.....	200 90		
Advertising	115 80		
Oil.	109 07		
Stone.....	175 00		
One boat.....	18 00		
Painting	40 00		
Diving	50 00		
Inspector	81 37		
Blow-off pipe.....	60 00		
Water pipe.....	19 25		
Use of tug	22 50		
Rubber boots.....	30 00		
Iron, brick and cement.	130 03		
Hose	55 00		
Rope	9 12		
Steam fitting	60 40		
		\$58,217 44	

DEDUCT—

Am't received for con-			
tract forfeit	\$ 200 00		
Am't received for sand			
sold	30 80		
Amount received from			
T. E. Courtney.....	48 76		
	\$ 279 56		\$57,937 88
Am't carried forward.		\$108,878 95	376,466 25

FINANCIAL STATEMENT.

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	Cash Payments.	True Cost.
Am't brought forward .	\$408,878 95	\$376,466 25

STREET LAMP REPAIRS.

Labor repairing lamps .	\$1,635 25	
Glass	1,218 22	
Tin and solder	231 76	
Lamp castings	713 06	
Lamp posts	136 60	
Repairing wagon.....	25 60	
Oil	20 98	
Lead and paint	10 10	
Gas tips	150 28	
Shop rent	110 00	
Horse shoeing	22 00	
Painting	22 85	
Hardware	25 41	
Acid	2 00	
Glass cutters	1 50	
		\$4,325 61

DEDUCT—

Am't received for broken lamps.....	\$ 154 35	\$4,171 26
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STREET SIGNS.

Glass	87 50	
Painting signs	99 96	
		\$ 187 46 \$ 187 46

OGDEN DITCH DAM.

Repairing dam.....	490 00	490 00
Total expend'res Approp- riation Fund.....	\$413,862 02	\$381,314 97

CITY HALL FUND.

RECEIPTS.

Amount of appropriation by City Council	\$200,000 00
Amount received from Public Buildings Fund	30,804 38
Total receipts	<u>\$230,804 38</u>

EXPENDITURES.

MISCELLANEOUS EXPENSE.

	Cash Payments.	True Cost.
Salary of Inspectors and Draughtsman	\$3,608 66	
Painting iron work	1,410 00	
Salary of experts examining building	1,000 00	
Paid John Angus for closing openings	275 00	
Reporting testimony before Council committee	425 60	
Stationery	129 85	
Iron arches	189 10	
Bar iron	123 23	
Lumber	19 52	
Advertising	34 80	
Traveling expenses to Bedford	41 35	
Plumbing	27 57	
	<u>\$7,284 68</u>	<u>\$7,284 68</u>

CONTRACTORS.

Paid P. J. Sexton, iron work	\$ 12,887 33	\$ 12,887 33
Paid John Angus, mason work	29,159 46	29,159 46
Paid Thomlinson & Reid, stone work	133,136 16	133,136 16
Paid Wm. McNeill & Son, Rotunda	5,793 75	5,793 75
Total expend'res City Hall Fund.	<u>\$188,261 38</u>	<u>\$188,261 38</u>

RECAPITULATION.

	Cash Payments.	True Cost.
Water Fund brought forward....	\$708,777 92	\$667,008 62
Sewerage Fund brought forward.	235,078 32	227,746 14
Sewerage Tax Fund brought forward	270,893 34	264,727 47
Appropriation Fund brought forward	413,882 02	381,314 97
City Hall Fund brought forward.	188,261 38	188,261 38
Total expenditures Department of Public Works.....	\$1,816,892 98	\$1,729,058 58

Respectfully submitted,

E. M. JOHNSON,

Accountant Department of Public Works.

MAP DEPARTMENT.

CHICAGO, December 31, 1879.

CHAS. S. WALLER, ESQ.,

Commissioner of Public Works :

DEAR SIR—I present herewith my annual report of the Map Department, for the year 1879 :

There are in use in the various Sub-Departments of Public Works five copies of "Peltzer's Atlas of Chicago," which have been posted during the year with all the subdivisions of lands recorded in that time. These subdivisions are seventy in number, and add three and a half miles to the number of miles of streets in in our city. There have also been entered on these atlases the changes in relation to public streets and alleys that were ordered by the following ordinances of the City Council :

OPENINGS, WIDENINGS AND EXTENSIONS.

Opening of Leavitt or Saratoga street through section 31—39—14, February 1.

Widening of State street from Twelfth street to Egan avenue, March 17.

Extending Vernon avenue northwardly through lot 6, in Assessor's Division of S. E. fractional $\frac{1}{4}$ section 27—39—14, April 10.

Straightening Douglas avenue from Forest avenue to Indiana avenue, July 7.

Opening Vernon avenue from the north line of Hy. Graves' subdivision, in the W. $\frac{1}{2}$ N. E. $\frac{1}{4}$ section 34—39—14, to Thirty-first street, July 7.

Widening West Madison street from California avenue to Kedzie avenue, July 7.

Opening West Twenty-first street from Union street to Jefferson street, October 27.

Opening Vernon avenue from Thirty-seventh street to Egan avenue, December 8.

REPEALING ORDINANCES.

Widening of West Madison street from California avenue to Crawford avenue, February 1.

Extension of alley in block 3, Brand's addition, February 1.

Opening alley from Twenty-third to Twenty-fourth street, between Indiana and Prairie avenues, April 17.

Straightening Douglas avenue from Indiana to South Park avenue, April 17.

Opening Vernon avenue from Thirty-first street to the north line of Graves' subdivision, in the W. $\frac{1}{2}$ N. E. $\frac{1}{4}$ section 34—39—14, April 17.

Opening and widening West Twelfth street from Ogden avenue to Crawford avenue, August 11.

VACATIONS.

North 113 feet of alley in rear of sub-lots 28 to 37 of lot 1, in block 40, in the W. $\frac{1}{2}$ of section 21—39—14, April 7.

Alley in the E. $\frac{1}{2}$ of block 93, in the W. $\frac{1}{2}$ of section 27—39—14, October 20.

Alley in rear of sub-lots 3 and 6, of lot 1, block 82, School Section, October 20.

CHANGING STREET NAMES.

Kansas street, to be named West Eleventh street, November 3.

Bremer street, to be named Milton avenue, December 11.

Emerald street, to be named Poplar avenue, December 15.

From the atlas has been prepared, during the year, the large number of maps and plats required by the department in connection with our special assessments, street surveys, sidewalks, etc.

In addition to the foregoing the following data, carefully compiled from the atlas, may not be without interest:

Our city covers an area of very little less than 36 square miles, or 23,040 acres. This number includes 789 acres, embraced in the public parks, 385 acres in the river, its branches, the slips and the Illinois and Michigan Canal, and 5,200 acres in public streets, measuring 650 miles and known by 907 names. Of the latter two are duplicated, namely:

1st. Wright street; one running from Wabansia avenue to North avenue and east of Elston avenue; another running from Morgan street to Stewart avenue, south of West Fourteenth street.

2d. Union Place; one being east of Union street and south of West Twenty-second street; another running from West Congress street to West Harrison street, between Rockwell street and Campbell avenue.

In the West Division more than one name is recorded for the following streets, which are on the same line, but interrupted by acre property not yet subdivided, and which, I think, should be known by one name only. They are

Harding avenue, otherwise Winthrop avenue and Moore Place.

Springfield avenue, otherwise Granville avenue and Margaret Place.

Avers avenue, otherwise Glover avenue and Bethuel street.

Bonney avenue, otherwise Bond street and Ridgeway avenue.

Millard avenue, otherwise Woodland street and Tinkham avenue.

Clifton Park avenue, otherwise Cynthia court and Byford avenue.

Idaho street, otherwise Diller street and Davis street.

Hamlin avenue, otherwise Mowry street.

Genesee avenue, otherwise Lawndale avenue.

Turner avenue, otherwise Phinney avenue.

Spaulding avenue, otherwise Sheridan street.

Merian street, otherwise Troy street.

Whipple street, otherwise Nichols street.

Nassan street, otherwise Sheridan avenue.

Fairfield avenue, otherwise Crown Place.

Campbell avenue, otherwise Seymour street.

Artesian avenue, otherwise Dania avenue.

STREET NUMBERS.

The long existing disorder and want of system in the house numbers in the South Division promise to come to an end by the passage, on the first of December, of an ordinance for the re-numbering of houses on the decimal system on all streets south of Twelfth street, running from north to south. The advantages offered by this plan will be readily understood by a perusal of the ordinance, and are too apparent to need any further comment. As regards the streets in the South Division north of Twelfth street, a petition was presented to the City Council on June 30th to re-number Wabash avenue, on the ground, that by ordinance of September 2, 1872, the name of River street, between South Water street and Rush street bridge, had been changed to "Wabash avenue," and that in consequence thereof there should be but one set of house numbers. The petition has not yet been reported upon. The re-numbering of Wabash

avenue, north of Twelfth street, as contemplated by the petition, would subject the business men on that important street to much annoyance and considerable expense, their house numbers being affixed to their signs, wagons, awnings, stationery, advertisements, etc. I think the most expedient way out of this difficulty would be to re-adopt the former name "River street" from South Water street to Rush street bridge.

Owing to the destruction of the official house number maps in the fire of 1871, and the failure to restore them until in 1874, many streets in the West and North Divisions are in great confusion in regard to the correct house numbers. On those occupied by the poorer classes, the owners or occupants, when about to number their buildings, generally omit to call for the official number, in order to avoid the payment of the fifty cent fee provided for in Section 4 of Chapter 51 of the Laws and Ordinances (p. 131). They make their own calculations, as to what should be their number, from the nearest one they find on any house in their neighborhood (sometimes hundreds of feet or several blocks distant), and the result is the present want of regularity. The new ordinance for the South Division having abolished the charge of fifty cents above mentioned, a repeal of the section named would, in my opinion, go far to improve the present condition. The receipts, moreover, from this source are very insignificant; during the year only forty-four certificates were issued, for which \$22.00 have been received and accounted for.

Respectfully submitted,

F. C. MEYER,

Superintendent Map Department.



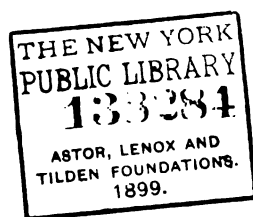


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FIFTH ANNUAL REPORT
OF THE
DEPARTMENT
OF
PUBLIC WORKS
TO THE
City Council of the City of Chicago,
FOR THE
FISCAL YEAR ENDING DECEMBER 31, 1880.

CHICAGO:
JAMESON & MORSE, PRINTERS, 162-164 CLARK STREET.
1881.

VDDA

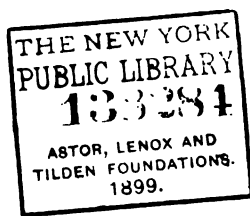


ANNUAL MESSAGE

OF

HON. CARTER H. HARRISON,

MAYOR OF CHICAGO.



ANNUAL MESSAGE
OF
HON. CARTER H. HARRISON,
MAYOR OF CHICAGO.

MAYOR'S OFFICE, CITY OF CHICAGO,

May 9, 1881.

To the City Council of the City of Chicago.

GENTLEMEN: In passing from my first into a second term of office as Mayor of this great City, I wish to express to the citizens of Chicago my deep gratitude for the high honor they have conferred upon me, and to assure them that in re-electing me by so handsome a majority I feel most keenly that they have placed me under increased obligations to do my best to merit their confidence. A public man should seek popularity only by being worthy of it. It shall be my earnest endeavor so to win it. To deserve the applause of the people is my highest ambition, to obtain it my greatest pleasure.

It is with confessed pride, gentlemen, that I congratulate you and the people of Chicago upon the unexampled prosperity she has enjoyed during the past two years, and upon the proud financial position she occupies among the cities of the world; and I felicitate myself that this proud eminence has been attained, to a great extent, during my first term of office. But while saying this, I wish to acknowledge that it has been my good fortune to be at the head of the City's affairs during a brighter day than was vouchsafed to my immediate predecessors. At the same time I owe to my able assistants the statement that they have been prompt in taking advantage of this brighter day, and that they have not wasted the sunshine.

Permit me to call your attention to the condition in which I found the City's affairs two years ago, and to contrast it with its present financial status.

Then, and for several prior years, the City, not having the means to pay her servants and obtain supplies with cash, was forced to issue scrip or warrants on the Treasurer, to be paid from taxes to be collected many months after such issuance.

In 1878, my predecessor—an economical officer—issued about \$2,238,000.00 of this scrip. This entailed upon employes a loss of from five to ten per cent. on the dollar, and upon the City, through its contracts, a loss of from \$150,000 to \$200,000 per annum.

By a system of most rigid economy I have been enabled to reduce the issuance of scrip to less than \$1,500,000 in 1879, and in 1880 to less than \$590,000.

In 1881 I hope to escape the blot of scrip entirely. For twenty-one months every employe has been paid in cash.

The City cannot legally borrow a dollar, and yet, not having ready money to meet her semi-annual interest, she was compelled to hypothecate the interest coupons when due, and to pay a heavy commission for carrying them until taxes could be collected. These illegal commissions cost her each year from \$50,000 to \$70,000.

Since 1879 we have promptly met our interest without borrowing or paying one cent of commissions. Two years ago the City owed \$249,000 of what was known as Hayes-Colvin certificates. These the courts had declared illegal. But our good name demanded that they should be paid. We have taken them all up, paying them in full, together with interest, the whole amounting to \$275,643.00.

In 1880 we paid off \$291,000 of 7-100 water bonds, and refunded \$490,000 of 6 and 7 per cent. sewerage bonds, with a like amount of $4\frac{1}{2}$ per cent. bonds, which we sold at over 2 per cent. premium, and on the first of April of this year we refunded \$843,500 of 7 per cent. municipal bonds, with a like amount of

4 per cent. bonds, which command to-day about 4 per cent. premium.

The annual savings of interest thus effected amounts to \$54,215.

In former years the sinking fund had become depleted by the amount of \$236,024; this we have restored,

From the appropriations of 1879 and 1880 we saved \$1,050,000. This heavy saving, added to taxes of prior years collected, and to cash from various sources, enabled us to contribute to the appropriation for 1881 \$550,000, and yet left in the general fund nearly \$1,500,000 as a reserve to meet current expenses and to enable us to avoid the issuance of scrip.

This financial showing I make, gentlemen, not boastfully, but to enable you and the people to enjoy with me a feeling of justifiable pride.

From savings of prior years we gave to the appropriation for this year \$550,000. We cannot hope to make like savings from the present appropriations. Prices of every material and of wages are on the increase. It will probably take every dollar of the appropriation to run the City. You have allowed only two and a half per cent. for probable deficiency in collection of taxes. Last year you allowed ten per cent. We may find ourselves on this account saddled with a deficiency. We can hope for but little from back taxes. I therefore earnestly recommend that you will look squarely in the face the probable necessity for raising a largely increased amount of revenue from licenses.

There is no reason why a poor peddler or expressman should pay a license to enable him to ply a trade which barely keeps his wife and child from starvation, while hundreds of dealers, whose occupations bring them princely incomes, should go scot free. There are occupations of a most profitable character, requiring no capital which the assessor can find, which could bear a very considerable price for license. There are other occupations which increase the fire hazard of the whole City to a great extent, which wear away our paved streets, many of those pursuing which have accumulated vast fortunes within a

few years, which could pay a larger revenue to the City than do its 3,000 saloons, and yet not feel depleted bank accounts.

The City will need something from many of these occupations to enable it to run decently next year.

Why should they go free, while the poor widow has to pay a license for the privilege of furnishing the rich with cooks and chambermaids, or the cripple for the privilege of earning his living at an apple stand? I earnestly urge you to provide for the collecting for licenses from every character of occupation permitted by the City's charter.

THE DEPARTMENT OF FINANCE.

The management of the finance of a great city like Chicago, laboring as it has under peculiar embarrassments, is not an easy task. Few men, fully impressed with its duties and responsibilities, would undertake it. The choice for this department has proved a fortunate one, and when I say that a more earnest, zealous and efficient Comptroller than its present incumbent has not filled the office, I only re-echo the opinion of leading financial men who have had any dealings with the City. He has ably assisted in carrying out the line of policy which I deemed the utmost importance in a scrip-ridden community. Through his energetic efforts cash payments were resumed, and my aim realized.

This change effected a saving to city employes of thousands of dollars per annum, and enabled us to make better bargains for the City's work.

With the same prudent management we shall continue on the cash basis and place the City in a position where it will never be obliged to go back to a depreciated paper, and stand, as it were, hat in hand, awaiting the pleasure and service of others. I refer you to the Comptroller's report for a detailed statement of the City's finances up to January 1st, 1881.

THE DEPARTMENT OF PUBLIC WORKS.

Under the immediate eye and control of this department rests all work of a public character. Without a vigilant care and the strictest honesty, thousands of dollars would be annually squandered, and rings of a most dangerous character fostered. The record of this department has demonstrated that its present head thoroughly understands the requirements of his position, and has rendered the public signal service by his firm course in awarding contracts upon their merits, and not through favoritism. Strict business principles have prevailed, and every contractor has been fairly and honestly served. In consequence there has been a most free and healthy competition for all public works.

The rings that predominated before have been routed at every turn. Their various attempts to assert themselves in important contracts have been frustrated, and the City has been a gainer thereby by thousands of dollars. More work has been accomplished for less money than the same class of work has cost before, and small appropriations have answered where larger ones would have been required were the old order of things in vogue. Of the improved order of things no better evidence can be furnished than the following comparative statements for the years 1877, 1878, 1879 and 1880:

COMPARATIVE STATEMENT

For the years 1877, 1878, 1879 and 1880, on quantities and cost of the following items:

	1877.	1878.	1879.	1880.
Cost of water pipe extension.....	\$90,511 43	\$77,617 77	\$119,851 00	\$229,177 91
Pumping Engines, North Side Water Works.....	84,865 90	69,573 82	63,077 00	68,737 84
Pumping Engines, West Side Water Works.....	48,919 80	46,469 84	50,715 44	44,555 41
Water Office expenses and salaries (collection taxes).....	61,527 06	63,279 39	52,305 07	49,826 04
Cost of delivering water per million gallons—				
N. Pumping Works.....	7 09	6 24	5 65	5 68
W. Pumping Works.....	6 66	5 45	5 02	5 15
Paid on account New City Hall....	20,520 81	157,571 34	188,261 38	344,828 12
Paid on account Public Parks.....	14,986 30	6,499 91	6,624 84	10,257 56
Construction of sewers.....	129,081 40	160,453 75	264,227 47	229,737 61
Repairing sewers and catch basins	9,778 97	11,701 97	22,430 08	8,644 21
Cleaning sewers and catch basins	35,729 33	25,704 37	29,283 67	25,561 48
Raising to grade man-holes and catch basins.....	6,693 47	7,557 52	5,243 10	10,578 16
Cost of cleaning streets by contractors.....	37,647 38	16,419 03	19,887 92	44,599 50
Cost of cleaning and repairing streets by City.....	138,691 47	136,002 70	119,098 08	157,823 27
Repairs of bridges and viaducts...	20,322 14	19,917 07	20,510 73	61,847 85
Income from water rents.....	908,500 64	944,190 97	922,011 26	865,618 35
QUANTITIES.				
Number miles water pipe laid.....	9	6	13 1-5	16 1-2
Number gallons water pumped—				
N. Pumping Works.....	11,958,977,644	11,145,370,232	11,153,102,981	12,354,008,905
W. Pumping Works.....	7,088,126,992	8,418,918,000	9,404,588,000	8,648,673,900
Daily average of water pumped at both works (gallons).....	52,184,000	53,600,789	56,225,000	57,225,000
Tons of coal used at N. Pumping Works.....	11,507	8,667	10,188	10,187
Tons of coal used at W. Pumping Works.....	4,841	3,984	8,506	6,106
Miles of sewers built.....	12 1-4	16 3-5	27 1-2	15
Number catch basins built.....	363	492	820	271
Number man holes built.....	431	603	1,043	554
Number miles of streets paved...	8 3-5	11 2-5	6 4 5	18 2-5
Number miles of sidewalk built...	31	8	51	40
Number miles of streets cleaned by contractors.....	1 850	814	925	1,683
Number miles of improved streets.	129 1-5	132 4-5	139 3-5	158
Number street lamps in use.....	10,714	10,785	10,882	11,080
Number street lamps repaired (aggregated).....	16,018	17,136	16,211	16,401
Number feet of oak lumber used repairing streets.....	269,281	116,448	144,167	142,730
Number feet of pine lumber used repairing streets.....	748,123	572,328	516,604	825,674

Nearly two years ago I earnestly urged the Council to take immediate steps for the erection of two additional pumping engines at the West Side Pumping Works. I again called your attention to it a year ago. I have found no reason to change my mind as to the urgency of this work. Should one or more of the present engines break, and no one can be sure that they will not, then an outraged people, suffering for water, which should be given them as freely as air, will call your supine neglect by the name crime.

I believe the wooden period for street paving should pass away from Chicago. Our central and heavily trafficked streets need something more durable than sappy pine or cedar blocks cut from burnt-over swamps. Granite and Medina sandstone can be had without stint.

The beauty and health of the City require that such pavements should become the rule and not the exception in the heart of the City. A few nervous gentlemen may object to the noise, but they should remember that the music of the pine covered forests is not compatible with the busy traffic of a mighty commercial city.

Ashland avenue, paved nine years since, and now nearly as smooth as when first improved, and Jackson street, which has stood the test of a severe winter's frost, and is to-day crowded by persons testing the metal of their roadsters, prove the great superiority of Macadam over wooden blocks for outside residence streets. It may be objected that they are muddy when wet and dusty when dry, but they are wet only a short period of the year, and properly constructed, sprinklers keep down the dust at a comparatively small cost.

I recommend that you will hereafter throw a cold shoulder to the wooden block contractor for such streets, and that you will understand that private contracts for paving streets are less for the interests of the City than of a few who engineer them through. Stone block pavement for the heavily trafficked streets, and good Macadam for outside streets, where rapid locomotion is desirable, and wide tired trucks and wagons, should be your care in the future.

THE POLICE DEPARTMENT.

In speaking of this department, I can say that it is upon a most efficient and satisfactory footing. Less crime has been prevalent than heretofore, and the morals of the City were never in better condition. The chiefs of this department have rendered me prompt and energetic service, and criminals have found it safer and more comfortable to remain away from the City.

What has been done can best be shown by the statement that while the recoveries of stolen property for the years 1877 and 1878 were within \$70,207 of the value of property reported stolen, they were only \$31,754 below the value of stolen property in 1879 and 1880; besides, the value of stolen property has been less for the past two years by \$69,444.

When I came into office two years ago there had existed for years in this City an organized gang of bank robbers, the most successful and daring of any in the whole country. They committed no known crime here, but making this their headquarters, raided banks throughout the Union. They defied the police or silenced them, and boasted that they could not be held in jail. In July, 1879, they committed a bold robbery in Galesburg and came here to enjoy their plunder. I determined that Chicago should not harbor outlaws to prey upon our neighbors. By careful working the Police Department found evidence against these fellows, and sent some of them to the scene of their crime. After long delays of the law, and against the machinations of corrupt but able friends, one of the gang is in our penitentiary for eight years; another, escaping to Canada, is incarcerated for several years; a third has been in jail in Galesburg for many months awaiting his trial, and the remainder are scattered and dare not again to come here.

The destruction of this gang has done much to terrify other organizations, and to keep them from making this their home. There is not to-day a single organized gang of outlaws in Chicago.

In connection with this improved state of affairs, I desire to say that the telephone police alarm stations have proved a most valuable adjunct to the department. We began with its introduction in the West Twelfth Street District, which was overrun with desperadoes, roughs and footpads, and finding it so useful in summoning police to apprehend this class, we have so extended the system to other portions of the City, that districts hitherto comparatively unprotected are now thoroughly under police surveillance. There have been established already some

ninety alarm stations, and had the City Council made a larger appropriation than it did, we should cover other still remote and unprotected sections. But for this change the present Police Force would be entirely inadequate to meet the demands of the City. Our force is the smallest of any large city in the country. The present number composing it is almost the same as it was when we had a little over half of our present population. Increased efficiency and telephonic communications have rendered the force doubly serviceable, and aided in the material and perceptible decrease in crime.

For this telephonic innovation and improvement upon old police methods, we are chiefly indebted to Professor John P. Barrett and Mr. Austin J. Doyle, who originated and perfected the system. The system contemplates connection with business houses and private residences, and already several have availed themselves of its benefit, to be in a position to receive prompt police assistance in case of an emergency. It has already proved itself of incalculable value to the department, and will be made to cover the City as rapidly as means will permit. I have directed the Superintendents of the Police and Fire Departments to make as large savings as possible in their respective departments, and to apply the same to an extension of the system. I hope in this way to cover to some extent the mistake made by the Council in not making a more liberal appropriation for the complete extension of the system over the City.

The success of our Police Department is the more striking when we contrast its number with that of other cities. The disparity may be shown by the following:

City.	Population.	Police Force.	Officer.	Inhabit- ants.
London	4,619,000	10.70	1	to 430
Paris	2,000,000	6.00	1	to 366
New York	1,200,000	25.60	1	to 468
Philadelphia	817,000	12.92	1	to 630
Brooklyn	566,000	5.99	1	to 945
Baltimore	300,000	5.94	1	to 500
Chicago	503,000	3.90	1	to 1,289

THE FIRE DEPARTMENT.

In looking over the records of this department for the past four years, I find that it has not only coped more successfully with fires, but kept down the average loss during the past two years at a point below that of the two preceding years, in spite of the greater number of conflagrations in the latter period. In 1877 and 1878 there were 928 fires, and the amount of loss involved was \$1,351,314, making the average loss \$2,989, while in 1879 and 1880 there were 1,606 fires and a loss of \$1,707,898, making the average loss only \$1,980. It will be accordingly noted from this that while there were 683 more fires during the past two years than during the two preceding years, the average loss has been \$1,009 less for the past two years. This speaks volumes of praise for the effective working of the force as at present constituted.

HEALTH DEPARTMENT.

No department of the City has shown more efficiency during my term of office than this. The City has grown in population with great rapidity. It has been impossible for the appliances necessary to health to keep pace with this growth. While the population of the City is that of one of centuries growth, the street pavements and sewerage system has been necessarily that of a City of two generations of men.

Many of the manufacturing interests have extended with a rapidity vastly beyond the City's growth. Some of these interests are of a character ordinarily offensive to the senses and supposed to be injurious to the health. A quarter of a century ago there were packed in Chicago 56,000 hogs; during the last year over 6,000,000. The slaughtering of other animals has increased almost as rapidly. Nearly all of this growth has been within the past decade.

The great amount of refuse matter from this vast horde of animals has to be taken care of. The most of it is utilized. This naturally gives out offensive odors, and, if not promptly attended to, breeds disease.

For years the summer air was offensive, that of autumn and winter often almost intolerable. Some of the finest portions of the City were often times for weeks unfit for delicate people to live in. By a steady perseverance, knowing no favor and fearing no opposition, fighting in the courts, abused and vilified, the head of the Health Department has done his duty. While he has fought stench, he has stood by me in upholding our great manufacturing interests. Consequently it can be said to-day that there has been nothing to offend the nostrils within eighteen months.

People are absolutely forgetting there ever was a Bridgeport stink, and yet the great industries which formerly caused these stench are growing day by day, until they are become one of the wonders of the world, and their proprietors, who formerly cursed us for forcing them, at great expense, to abate and prevent nuisances, are to-day our warmest supporters.

Our people, easily alarmed by a sensational press, make great outcries when the water happens to be less clear than crystal, and demand that we spend some ten millions to get a new water supply, that they may then growl at the cost which such outlay will entail. In 1877, for a few days, the water supply was somewhat defiled, and lately it has been roily for some ten days. But even during these worst days Chicago's water was better than that in everyday use in many American cities, and pure compared to that of any of the large European cities. A change from one kind of water to another nearly always effects one unpleasantly and sometimes injuriously. No one from any of our inland countries, where hard limestone water comes from spring or well, can go from Niagara to Montreal by boat without suffering disagreeable effects. The effects are, however, temporary. And yet the water of Lake Ontario and the St. Lawrence is of crystal clearness.

The flood pouring from an overflowed country lately caused a changed water to come from our crib and affected our people temporarily. It was injurious to very weak people and caused strong ones (to their bodily discomfort) to take to so-called mineral water or to indulge unusually in beer or liquor, and at once

reporters seeking items find doctors eager to cry "poison in our water." A little precaution for a week or so every few years can prevent our people from suffering, and during all the remainder of their lives here they enjoy the coolest and purest water of the inhabitants of any large city on the face of the globe.

Some people who have been, to my knowledge, horrified during the past ten days at Chicago's water, are now going with or sending their families to Europe, where they can in no city get a glass of water much purer than can be dipped up inside of our breakwater. Over there they will drink mineral water and wine, and will spend thousands of dollars to have the opportunity of doing so in foreign lands.

Their steward's fees aboard ship would have purchased pure water from Waukesha for the entire time during which the water of the City has been lately roiled.

The following statement will show that no one need flee from Chicago to find a more healthy city:

MORTALITY REPORTS FOR 1880.

Cities of Over 200,000 Population.	Population.	Total Deaths.	Amount Death Rate per 1,000.
New York City.....	1,206,577	32,245	26.7
Philadelphia.....	846,980	17,701	20.9
Brooklyn.....	566,689	13,576	24.0
Chicago.....	503,298	10,462	20.8
Boston.....	362,535	8,634	23.5
St. Louis.....	350,522	6,725	19.2
Cincinnati.....	255,708	5,331	20.9
Baltimore.....	332,190	8,216	24.7
San Francisco.....	233,956	4,518	19.3
New Orleans.....	216,140	5,631	24.2

GAMBLING.

One of the questions which has agitated our citizens and the public press recently is that of gambling. On this subject I have been severely criticised in some quarters and in other

quarters as eminently respectable I have been indorsed in the position I have assumed. If not openly, it has been very generally tacitly admitted that it is impossible to thoroughly eradicate the evil, but as to the exact course to pursue towards it, a diversity of opinions exists among those who have fully examined this phase of social life.

"We cannot," some say, "rid the community of gambling," but how can the evil be reduced to its minimum effect? There seems to be the rub. Those who have so rigorously cried out for its extermination have failed to suggest any possible or practicable plan by which the desired end can be accomplished. In their blind zeal they seem to forget the essential results of all attempts, viz.: That every effort at its annihilation has been attended with a dismal failure. They are by no means left without practical examples of the results of such efforts. If they would only pause in their frenzy and direct their attention to the time sporting or club houses were presumptively closed, they would easily recall facts that indicated that not only the private precincts of hotels and public buildings, but fashionable resorts were invaded and games of chance indulged in. There, free from and unobserved by the guardians of the law, young as well as old were "taken in and fleeced." A few wealthy gamblers managed to run their places behind locked doors, and by means of a liberal feeing, officers intrusted to see that there was no gambling, blinked at violations of the law, passed on and kept the central authorities in ignorance of their existence. When it was finally discovered that one place was in full blast, the police made a descent upon it, an explosion of powder ensued, and the case went into the State courts, where Judge McAllister held substantially that police officers had no authority to break in the doors of places where it was not absolutely certain that gambling was being regularly conducted therein. This decision was looked upon as a victory by the gamblers, and gambling shops opened, with various self-imposed restrictions, in different sections of the City. Ropers-in flourished extensively and gambling held undisputed sway behind doubly barred and screened doors. Subsequently the owners of these places

put a bold front to their vocation, and in view of former experience, the then existing administration evinced no special inclination to break them up. They were accordingly in a high tide of prosperity long before I entered upon the Mayoralty, and the authorities were fully cognizant at all times of their location.

Considering what the results had been, I came to the conclusion on becoming Mayor that the evil must be kept within proper bounds and restrictions. More than that, I determined to restrict these houses to the central portions of the City, where they could be closely watched and kept in check. By this course of procedure I had in view the easy and unrestricted entrance of either the police to detect sharp practices by the gamblers, keep minors out and find any crooked person who might seek its enchantments, or of business men who might desire to see whether an employe was squandering money surreptitiously taken from his funds. By such course as I have thus outlined I have had the endorsement of a large number of citizens, and the results have been far better than they would have been under different conditions. Under the apparent rigid rule in vogue in 1873, there were in the City forty-four gambling establishments and twenty odd bunko places; in 1877, over thirty gambling houses and a dozen or more bunko rooms, while during 1880 there have not been more than seventeen of the former and not a single bunko establishment. I notice the correspondent of the *Tribune* says there are in Washington City, with a population less than one-third of that of Chicago, from twenty-five to thirty gambling houses in full blast, and yet he says they pull them frequently and break up their furniture. The present state of affairs here is due to restrictions, and while a great number of complaints came to my office shortly after my inauguration, there have not been more than a half dozen within the past eighteen months. The plan of keeping these places in the heart of the City enables the police officers to learn where brace boxes are played upon unsuspecting victims. Such houses are promptly dealt with. Those that are run are put upon their good behavior, minors are excluded, and those who

must play protected from the tricks of dealers, and games of a character calculated to attract the man of small means and the young are being entirely prevented.

I am not defending gambling *per se*, but if my position is wrong in dealing with it from a practical stand point, the people have their remedy. They can appeal to an authority higher than mine; and strange it is that such citizens and newspapers as have assailed me have *not* also directed their batteries toward that authority. Those who think my plan not the best have a State law under which anyone so disposed can take his hand in suppressing gambling.

I fear, however, that Mr. Lincoln was not mistaken when he said that "statutory enactments can't turn a calf's tail into a third hind leg." The fireside, the lyceum and the well stocked public library will do more than laws to suppress social evils.

But those who differ with me have a law under which a citizen, feeling that the community has been outraged by the existence of gambling, can go and swear out a warrant and secure satisfaction. The Grand Jury are open to his complaints, and even the assistance of the State's Attorney can be invoked.

In conclusion, I desire to return my thanks to the members of the outgoing Council and to the various heads of the different departments for their kind assistance and courtesies, and to ask the indulgence and aid of the incoming Council in all measures looking to the welfare and prosperity of the city.

CARTER H. HARRISON, *Mayor*.

DEPARTMENT OF PUBLIC WORKS.

OFFICERS:

CHARLES S. WALLER,

COMMISSIONER.

D. S. MEAD,

Secretary.

F. C. MEYER,

Book-keeper.

SUB-DEPARTMENTS.

DEWITT C. CREGIER,		CITY ENGINEER.
WILLIAM FOGARTY,		SUPERINTENDENT OF STREETS.
G. HOWARD-ELLERS,		SUPERINTENDENT OF SEWERAGE DEPT.
HERMANN LIEB,		SUPERINTENDENT OF WATER OFFICE.
O. F. WOODFORD,		WATER TAX ASSESSOR.
JOHN HISE,		CASHIER.
J. K. TINNY,		REGISTRAR.
H. J. JONES,		SUP'T SPECIAL ASSESSMENT DEPT.
FRANCIS A. DEMMLER,		SUP'T OF MAP DEPARTMENT.

COMMISSIONER'S REPORT.

OFFICE OF THE DEPARTMENT OF PUBLIC WORKS,
CHICAGO, April 10, 1881.

To the Honorable Mayor and City Council of the City of Chicago.

GENTLEMEN: I submit herewith the Fifth Annual Report of the Department of Public Works, being for the year ending December 31st, 1880.

The entire work of this Department, during the year 1880, condensed into aggregates for quick and easy examination, calculation and comparison, was as follows:

STREET WORK.

Streets paved and improved, 96,956 feet, as follows:

With Wooden Blocks.....	72,234 feet.
“ Macadam	13,152 “
“ Stone	1,036 “
“ Graveling.....	1,785 “
“ Oak Planking	1,035 “
“ Curb Wall and Filling	6,921 “
“ Curb Stone and Filling	793 “

Total, $18\frac{1}{2}\frac{1}{8}$ miles, or..... 96,956 feet.

Costing for the City's part	\$145,347 75
And by Local Assessments	539,921 01

Total \$685,268 76

About 40 miles of sidewalks were built during the year 1880, of which about 38 miles were built of wood, and 2 miles of stone or concrete.

STREET CLEANING.

Sixteen hundred and eighty-three miles of street cleaning was done by contract during the year 1880, at \$26.50 per mile, distributed as follows:

In South Division	934 miles.
In West Division	460 "
In North Division	289 "

Making 1683 miles.

Three hundred and eighty-five miles of unimproved streets were graded and otherwise worked upon during the year 1880, as follows:

In West Division	272 miles.
In North Division	62 "
In South Division	51 "

Making 385 miles.

Nine miles of Macadam and cindered streets were repaired.

In the repairs at intersections of streets, for aprons, street and alley crossings, culverts, drain boxes, etc., and for other general repairs in the Street Department, the quantity of lumber used as shown by the report of the Superintendent of Streets, was as follows:

Of Pine	825,674 feet.
Of Oak	142,730 "

Total 968,404 feet.

The whole amount expended during the year 1880, for street repairs and cleaning, was as follows:

In South Division	\$60,641 51
In West Division	72,649 35
In North Division	24,532 41

Total \$157,823 27

GAS LAMPS.

At the close of the year 1880, the whole number of street lamps in the City was 11,080, distributed as follows:

In West Division.....	5656
In South Division.....	3153
In North Division.....	2271
Total.....	11,080

The whole number of street lamps repaired during the year, was 16,401, as follows:

Repaired with glass.....	14,867
Tin work repaired and painted.....	935
Three-fourths of lamp made new.....	599
Total.....	16,401

The average breakage was 41 per day.

There were 558 new lamps put in between corners, and 979 new corner lamps put in with street guides. The lamps of the City and the street guides upon them have been greatly improved during the past year.

The whole expense of the Street Lamp Department for the year 1880, for materials and labor, including lamp posts, was \$11,257 49.

The lighting of the City cost in 1880 as follows:

Chicago Gas Company's bill.....	\$116,988 97
Peoples Gas Company's bill.....	137,893 75
Total.....	\$254,882 72

WATER WORKS.

The whole quantity of water pipes laid during the year 1880, was 87,243 feet, $16\frac{27}{5}\frac{63}{80}$ miles.

(The sizes are given in detailed report of the City Engineer.)

The whole number of hydrants put in during the year, was 177

The whole number of stop-cocks put in during the year, was 125

The whole number of new meters put in during the year, was 135
 The whole number of water engines connected to elevators
 during the year, was..... 57

At the Pumping Works, North Side (four engines), the total quantity of water pumped during the year 1880, was 12,354,008,905 gallons. The daily average was about $33\frac{1}{4}$ millions of gallons. (Nearly $3\frac{1}{4}$ millions per day more than in 1879.) During the month of June, 1880, the daily average was $36\frac{1}{4}$ millions.

At the Pumping Works, West Side (two engines), the total quantity of water pumped during the year 1880, was 8,648,673,000, the daily average was nearly 24 million gallons. During the month of August, 1880, the daily average was $26\frac{1}{2}$ millions.

The total quantity of water pumped at both pumping works during the year 1880, was 21,002,681,905 gallons, an average of over 57 millions per day, and during the month of July, the daily average was nearly 62 millions.

COAL USED.

	POUNDS.
At North Pumping Works during the year 1880...	20,375,210
General average per day	55,822
At West Pumping Works during the year 1880—	
Lackawana, lbs	3,043,861
Soft Coal, lbs	9,169,145
General average per day	33,460
The expense of running the North Pumping Works	
during the year 1880, was in all	\$68,737 84
The expense of running the West Pumping Works	
during the year 1880, was in all	\$44,555 41
(For details see bookkeeper's report herewith accompanying.)	

The cost of pumping the water at North Pumping Works for past ten years has been as follows:

In 1871, per million gallons	\$11 31
" 1872, " " "	12 02
" 1873, " " "	11 64
" 1874, " " "	12 86
" 1875, " " "	10 81

In 1876, per million gallons	9 56
" 1877, " " "	7 09
" 1878, " " "	6 24
" 1879, " " "	5 65
" 1880, " " "	5 68

The cost of pumping the water at the West Pumping Works since commencement, has been as follows:

In 1877, per million gallons	\$ 6 66
" 1878, " " "	5 45
" 1879, " " "	5 02
" 1880, " " "	5 15

The entire cost of the whole water system of the city up to December 31, 1880, was \$8,802,725 10, as follows:

Whole cost May 6, 1861, when Board of Public Works was organized	\$1,020,160 21
Less transferred to North Pumping Works account, for cost of two engines and \$5,000 for cost of lot	88,500 00
Leaving	\$ 931,660 21
Cost of Water Pipe laid since 1861	\$4,960,010 87
Cost of North Pumping Works	807,249 44
Cost of West Pumping Works	510,619 46
Cost of Lake Tunnel	464,866 05
Cost of Second Lake Tunnel	415,709 36
Cost of Land Tunnel extension of Lake Tunnel to West Pumping Works	542,912 63
Cost of Lake Tunnel Crib	70,253 31
Cost of New Shore Inlet	42,871 17
Cost of West Reservoir	1,702 87
Cost of Water Works Shops	25,551 73
Cost of Water Works Stock	29,318 00
Total	\$8,802,725 10

Total income from Water Rents to December 31, 1880	\$11,200,158 61
Total operating expense and maintenance to December 31, 1880, including interest on the bonded debt and bonds canceled	\$ 9,434,190 93
Surplus of income over operating expenses and maintenance.....	\$ 1,765,967 68

BONDS.

Water Loan Bonds, 7 per cent., outstanding Decem- ber 31, 1880	\$3,625,000 00
Water Loan Bonds, 6 per cent., outstanding Decem- ber 31, 1880.....	330,000 00
Total unpaid Water Loan Bonds.....	\$3,955,000 00

Net balance to Credit of the Water Fund Decem- ber 31st, 1880	\$208,912 06
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The following table exhibits the amount of water furnished, and the revenue per million gallons received annually, by the City from the year 1858 to 1880 inclusive:

YEAR.	MILLION GALLONS FURNISHED.	REVENUE.	REVENUE PER MILLION GALLONS.
1858	1,092	\$102,178 85	\$93 57
1859	1,415	122,753 50	86 70
1860	1,717	131,162 73	76 39
1861	1,766	131,035 10	74 15
1862 (fifteen months) ..	2,705	188,448 25	85 00
1863	2,336	192,246 39	82 29
1864	2,523	224,902 57	89 14
1865	2,778	253,114 49	91 11
1866	3,169	302,017 59	95 30
1867	4,232	338,929 28	80 08
1868	5,375	420,686 94	78 26

YEAR.	MILLION GALLONS FURNISHED.	REVENUE.	REVENUE PER MILLION GALLONS.
1869	6,801	\$476,968 24	\$70 13
1870	7,945	539,180 19	67 86
1871	8,423	445,834 64	52 93
1872	10,051	544,465 90	54 17
1873	11,723	708,804 32	60 46
1874	13,903	705,926 64	50 77
1875 (nine months)	10,957	635,996 54	58 04
1876	15,346	771,940 38	50 30
1877	19,047	908,509 64	47 70
1878	19,564	944,190 97	48 31
1879	20,557	922,001 26	44 85
1880	21,002	865,618 35	41 21

WATER TUNNELS.

Two brick tunnels were built under the river during the year 1880, in the extension of Water Mains, to-wit:

At Harrison Street, for 36 inch Water Pipe, cost . . . \$7,883 50
 At Clybourne Place, for 16 inch Water Pipe, cost . . . 6,875 42

Water Mains are now laid under the Chicago River at the following points:

Adams St.,	12 inch	pipe, through brick tunnel.
Archer Ave.,	12 and 16	" " " "
Chicago Ave.,	24	" " " "
Clybourne Pl.,	16	" " " "
Division St.,	24	" " " "
Eighteenth St.,	24	" " tunnel cut through rock.
Harrison St.,	36	" " brick tunnel.
LaSalle St.,	36	" " general traffic tunnel.
Main St.,	36	" " brick tunnel.
Rush St.,	24	" " " "
Twelfth St.,	16	" " iron pipe on river bottom.

WATER FUND.

Receipts and Disbursements in 1880.

(For details of these see book-keeper's report.)

RECEIPTS.

For current Water Rent collected.	\$857,409	25
“ delinquent “ “ .	2,960	12
“ penalties on “ “ .	5,248	98
Total.....	\$865,618	35
For Water Pipe Extension (including Scrap Iron sold).....	28,926	81
For Water Meters.....	10,728	43
“ Water Service Cocks.....	7,448	95
Miscellaneous Receipts (including advances for laying Water Pipe)	8,062	62
Total.....	\$920,785	16

EXPENDITURES.

North Pumping Works.....	\$68,737	84
West Pumping Works.....	44,555	41
Water Office Salaries.....	\$45,440	42
Other expenses including $\frac{1}{8}$ Salary of Commissioner and others . . .	7,818	94
	53,259	36
Water Works Shops.....	16,124	28
Water Pipe Extension.....	229,177	91
Water Work Repairs.....	22,200	52
Water Meters.....	15,970	05
Hydrants (maintenance).....	12,664	09
Lake Tunnel Crib.....	3,048	32
Water Service Cocks.....	8,615	60
Pumping Lake Tunnel (Order of Council).....	524	67
Advances for Laying Water Pipe, etc. refunded.....	972	14
Water Loan Interest paid.....	282,873	03
Water Works Stables.....	1,234	79
Amounting to.....	\$759,958	01

WATER BONDS RETIRED.

Besides the above disbursements, 291 \$1000.00
 Water Bonds due July 1st, 1880, were taken
 up and cancelled. Costing \$291,000 00

LAKE TUNNEL CRIB.

The amount expended on the Lake Tunnel Crib
 during the year, including Crib-keeper's
 salary and use of tug, was \$3,048 32

PUMPING LAKE TUNNEL.

Under an order of Council some preparations were made
 late in the year 1880 for pumping out the old Lake Tunnel, to
 examine its condition and repair it if necessary; owing to the
 severity of the weather the work was postponed until the spring
 of 1881. It will be attended to as soon as the season of mild
 weather sets in.

The cost of the preparations referred to was..... \$524 67

SEWERS.

The whole amount of sewerage put in during the year 1880,
 was 79,128 feet, nearly 15 miles, as follows:

In West Division.....	6.98 miles.
“ South “	6.11 “
“ North “	1.89 “
Total.....	14.98 miles.

Amount paid out for constructing same was as follows:

In West Division.....	\$95,151 67
“ South “	56,365 50
“ North “	28,008 81
Total.....	\$179,525 94

There was also paid out for repairs of sewers during the
 year 1880, as follows:

In South Division	\$2,183 15
“ West “	4,710 98
“ North “	1,750 08
Total	<u>\$8,644 21</u>

And for cleaning sewers, as follows :

In South Division	\$8,853 86
“ West “	11,372 53
“ North “	5,335 09
Total	<u>\$25,561 48</u>

Number of catch-basins built in 1880	271
Number of man-holes built in 1880	554

Whole number in the City, December 31st, 1881:

Catch-basins	10,062
Man-holes	11,953

Whole number of miles of sewerage in the City,

December 31, 1880..... 337 $\frac{1}{4}$ miles.

BONDS.

Sewerage-Loan Bonds outstanding Dec. 31, 1880:

7 % Bonds	\$2,133,000 00
4 $\frac{1}{2}$ % Bonds	490,000 00
Total	<u>\$2,623,000 00</u>

COST OF SEWERS.

North Division, to Dec. 31, 1880	\$1,075,662 31
South Division, “ “	1,458,665 02
West Division, “ “	2,677,399 41
Total	<u>\$5,211,726 74</u>

The following comparative table taken from the report of the Superintendent of Sewerage for the year 1880 (herewith accompanying), is very encouraging to our city. I subjoin the Superintendent's comment at the foot of said table.

CITIES. 31st December, 1880.	Area in Acres.	Population by Census of 1880.	Sewers in Linear Feet.	Density of Population per Acre.	Square feet of Area to each Inhabitant.	Linear Feet of Sewers per Acre.	Linear Feet of Sewers per head of Population.
New York.....	26,401	1,206,577	2,041,264	45.70	953	77.3	1.69
Philadelphia...	82,803	846,980	1,056,000	10.23	4,258	12.9	1.25
Brooklyn.....	13,338	566,689	1,592,659	42.49	1,025	119.4	2.81
Chicago.....	22,797	503,501	1,780,689	22.00	1,973	78.8	3.54
Boston.....	4,416	362,535	1,056,000	82.00	531	239.0	2.91
St. Louis.....	40,000	350,522	1,068,144	8.76	4,971	27.7	3.04
Cincinnati.....	15,360	255,708	249,920	16.64	2,617	16.3	0.98
San Francisco.	26,880	233,965	660,000	8.70	5,005	24.5	2.82

"Thus it will be seen that the City of Chicago, *fourth* on the list as regards population, and *seventh* as regards age, occupies the *first place* when we come to consider the linear feet of sewerage, finished and in use, per head of population."

NEW CITY HALL.

The amount expended in the progress made in the erection of the New City Hall, during the year 1880, was \$344,828 12

FULLERTON AVENUE CONDUIT.

Paid for Engines on account.....	\$2,000 00
" Engine House, balance in full	1,000 00
" Running Expenses, etc.....	9,766 76
Total	\$12,766 76

The entire original cost of the Fullerton Avenue Conduit was..... \$566,515 13

CHICAGO RIVER.

No dredging was done during the year 1880, because the bids for doing the work were considered excessive, and more than is charged for similar work at other points; an increase of water enabled the city to get through the year without dredging.

BRIDGES AND VIADUCTS.

The amount expended for repairs of bridges and viaducts during the year 1880 was..... \$61,847 85

The heaviest and most extensive of these repairs were made on Madison, State and Eighteenth Street Bridges. (*See City Engineer's Report.*)

PARKS.

The amounts expended on the various small parks throughout the City, during the year 1880, were principally for maintenance, including the salaries of keepers and pay of laborers, as follows:

Washington Square.....	\$ 999 26
Ellis Park.....	671 95
Lake Park (including \$200 for trees)	2,170 47
Union Park (including food for animals)	1,730 01
Jefferson Park (including park seats)	1,489 78
Vernon Park.....	1,221 63
Wicker Park (including fountain, etc.)	1,520 41
Campbell Park " "	154 05
Oak Park (including \$110 for trees)	139 23
Green Bay Park (including \$110 for trees)	160 77

The amount appropriated for the use and requirements of this Department for the year 1880 (not including Water Fund and New City Hall Fund), was\$1,110,340 53
 Of this was expended during the year 1880, in all. 842,924 26
 Leaving unexpended.....\$ 267,416 27

For details of receipts and expenditures, and a full and clear showing of all the accounts of the Department, see the report of the faithful and efficient Chief-Book-keeper herewith accompanying, and I would especially commend this report for its clear, concise, methodical and business-like arrangement and presentation of the accounts of the Department, intelligible to every one, and a great improvement over all its predecessors.

STREET PAVING.

In my last annual report, and in several subsequent communications to the City Council, I have advocated the substitution of stone for wood in street paving—granite blocks on streets of heavy traffic, and Macadam topped with granite on other important streets leading to the heart of the city. Surely the wretched condition of our streets to-day furnishes an unanswerable argument against continuing the system of laying wooden blocks. Millions of dollars have been expended in paving the City, and yet we are but little nearer the goal of well-paved streets now than at the commencement. A few of the latest-paved streets with wooden blocks are temporarily good, but these must all be removed under a permanent system. With 651 miles of streets now, and the City rapidly growing, what possible hope can we have, under the present system of short-lived wooden pavements, ever to see the streets of our City well and universally paved? We can only pave a comparatively small portion each year. If we were to attempt to do the whole in a few years, the sudden and enormous cost would be almost equal to a complete confiscation of the real estate of the City. It is clear that we must do this work by degrees, as we can afford to do it. Now, if we use such material as will speedily decay, and will necessitate being done over again every few years, can we ever hope to get through, or to see our streets in much better condition than they are at present? There is no other way, in my opinion, but to advance steadily from year to year toward the accomplishment of a completely paved city, by using imperishable material and doing the work thoroughly and permanently as we progress. It will take

many years of continuous persistent effort to pave the City properly, and the sooner we adopt the only system which will hold together and remain intact until the whole be accomplished, the sooner will we reach the desired end. The day for laying plank roads and using temporary expedients in the heart of the city has passed; let us do thorough work hereafter, commencing in the centre and radiating in time to the extreme limits on every side. We want good foundations for our streets to begin with, thoroughly built, put there to stay; if imperishable material only shall be used, as there is no wear upon the substructure, being properly done at first, it need never be replaced. Our best limestone laid carefully and compacted properly is all that we need for this. A topping of ordinary macadam covered with good gravel, free from loam, will answer for most streets outside of the central districts; the roadbed will thus be properly prepared and ready for a better covering hereafter. On the principal streets leading to the heart of the City, and on residence streets where there is much driving, the same foundation will answer, covered to within four inches of the top with good Macadam, and then topping with granite Macadam, and filling the interstices of the first layers with good gravel, free from loam, wet down as laid, and thoroughly rolled and compacted, and also filling the interstices of the four inches of granite Macadam on top with crushed granite, wet down and rolled, presenting a firm and durable surface, like facing an edged tool with steel to prevent rapid wear, and thus avoiding the dust and mud of an ordinary turnpike topped only with limestone. A street thus paved and carefully looked after and kept up by prompt and timely repairs with the same material, need never wear out, but will grow firmer and better and smoother by age. The annual repairs upon such a street would be very light, if promptly attended to, simply filling in with crushed granite or Macadam granite, as might be needed, whenever a place on the street begins to wear into a hole, or the slightest unevenness. Such pavements, and such a system of prompt attention to them, would give us the prettiest driving streets in the world, smooth as a floor, permanently firm, and comparatively noiseless. A system of watchful and continuous repairs, and the whole expense attending it, may

be easily provided for by a light, annual special tax upon vehicles. To have good streets and pay a light special tax for the comfort and convenience in using them would be a genuine economy and saving to the owners of horses and vehicles in the City. When they reflect upon the injury done to horses, and the breaking and repairs to vehicles, caused by bad streets, such as they have been compelled to drive over during the past winter, I am sure that all would gladly pay this light tax to have the advantage of the individual benefits and savings which it would bring to each.

It is hardly necessary to mention the importance of forbidding the use of narrow tires with such vehicles as carry heavy loads upon our streets. The sentiment seems to be universal that this is a much-needed reform, and should be speedily inaugurated by the City Council.

As to the comparative expense between durable stone pavements and seemingly cheap wooden substitutes, apart from all other considerations (some of which I have named in this paper), in the long run the permanent pavement is not only unquestionably the cheapest, but a great deal cheaper than any sort or class of temporary expedients. While the expenses of our own City and its present condition as to street pavements demonstrates this beyond all question, the experience of other cities has been similar to our own. From an Official Report of the City Civil Engineer of Cleveland, Ohio, made to the City Council of that city in December last, I quote the following:

"There has been expended for wood pavements in this City, during the last fourteen years, \$1,278,797, and probably within the next six years all the wood pavements now in use will be worn out. If good stone pavements had been laid at first, they would not have cost as much as the wood by about one-fourth, and they would, with some repairs have lasted fifty years, while the average life of wood pavements is not more than ten years; or, one good stone pavement will outlast five wood pavements; or, if the wood-paved streets had been laid with stone they would have cost about \$975,000, and the taxpayers would not now be called upon to repave the streets. If these streets should continue to be repaved with wood at the end of every ten years, the expense would be for fifty years (the life of a good stone pavement) \$6,393,935, showing a saving of over \$5,400,000 in favor

of stone on streets now paved with wood, in fifty years. From the above it is plain to be seen that the only way to avoid the 'everlasting paving tax' is to lay stone pavements."

The stone referred to in the above quotation is probably a species of sandstone accessible to that city, and which would probably wear away, as the City Engineer states, in fifty years. Chicago wants a better and more durable stone than this.

SIDEWALKS.

Our sidewalks, like our street pavements, being generally constructed of wood, are in a like dilapidated and unsatisfactory condition. A start in the right direction has been made by the City Council, by the passage of an ordinance in February last, requiring that all sidewalks which shall be constructed on the South Side, north of and including VanBuren street, after May 1st, 1881, shall be built of "stone or other incombustible material." Our present sidewalk system is very imperfect and unsatisfactory; the delays in having new sidewalks built, or old ones repaired, are so great that we have continually many places in the City where the sidewalks are not only unpleasant but unsafe to walk upon. I submitted a statement to the City Council in November last, showing that it was costing the City an average of over \$1,000 per month for damages because of injuries incurred through defective sidewalks. As with the streets, so with the sidewalks, we should discard *wood* as rapidly as possible. But, as many of the outlying districts of the City will insist upon using wooden sidewalks for several years to come, a system should be adopted to keep them promptly and thoroughly in repair to prevent accidents, and for the convenience and comfort of the whole City. I submitted a plan for such a system to the City Council in November last; if adopted I am sure it would remedy to a great extent the worst and most deplorable features of our present sidewalk system.

STREET AND SIDEWALK SUPERVISION.

Our City has grown too large to be managed successfully any longer under a system which was adopted and adapted to the wants simply of a village. The Department of Streets is the largest and most important department in my charge. Under the growth of the City this department requires a more comprehensive system than we now have to enable the work confided to it to be thoroughly and uniformly done throughout the City. The only way to do this effectually is to divide up the City in convenient sized districts, and place a District Superintendent over each, whose duty it shall be to look carefully after the streets and sidewalks in his district, as to needed repairs, and to report them promptly to the general office of the Street Department; to supervise the street cleaning in his district, and to see that the streets, alleys and sidewalks throughout his district are properly looked after and attended to under the general regulations of the City. Such District Superintendents must be competent, reliable men, and to get such, the City should pay fair salaries; they should give bond, and be held responsible for neglect of duty, or for damages incurred from defective sidewalks, when not reported by them to the general office within a reasonable time. Each one should have an office or desk in the central part of his district, where he could be found during a certain hour each day, and where complaints from the people of his district, pertaining to his duties, could be first made.

It is only through such a system, with the present magnitude of the City, that every part thereof can have careful and equal as well as timely attention in these matters, which is certainly desirable and but simple justice to all.

OUR WATER SYSTEM.

There are many points of vital importance connected with our present Water System and supply, which demand early and careful consideration and action.

1. We want water that is unquestionably pure and healthy, for the permanent use and comfort of our people, and as one of the blessings and attractions of our City.

2. We want an abundance of it, a steady and unfailing supply, for domestic purposes, for protection against fire, for general cleanliness, and for mechanical uses.

3. We should remember the present size of our City, the elements of prosperity which surround it, the vast and fertile country of which it is the metropolis, its unprecedented growth, the wonderful energy and activity of its people, and thus, judging by a single decade in the past, estimate what these mighty influences will produce in the further enlargement of Chicago within the present generation.

4. We have the grandest reservoir in the world of pure water at our doors, unfailing in supply, in freshness and in purity. If, therefore, we adapt our water system to our surroundings, profiting by the experiences of the past, and looking carefully to the wants and contingencies of the future, our City will be blessed beyond almost any other, with a permanent and abundant supply of this great essential to human life, and especially to the wants of a large city, for protection, cleanliness, and abiding comfort.

Our present water system is growing more and more unsatisfactory and unreliable year by year; it is only a question of time when the impurities of the City will reach and seriously affect the present source of our water supply. The Crib was not a substantial and durable structure when erected, and, unless it be protected by massive sea walls of stone, it is liable, in my opinion, to be swept away in the near future during one of our severe winter storms. We have had considerable difficulty in preserving it during the past winter, and the expense of protection and keeping the inlets clear of ice has been quite heavy. The question of the City sewage and how to dispose of it, is intimately connected with that of our water supply; if we drain into the lake, it will affect our drinking water; if we direct it the other way, and send it down the canal, it offends our neighbors, and we do not wish to do that. The whole question is one deserving serious, earnest, and immediate attention. In view of all the circumstances, I incline to the opinion that the suggestion to remove our pumping works north, up the lake shore, say twenty miles or more, to the highest point of land

having the requisite advantages of deep, pure water, comparatively near the shore, and a suitable area of contiguous table land, of sufficient size, for the construction of one or more reservoirs, as shall be required, for the present and future needs of the City, and bring the water from this point to the City by one or more tunnels, is probably the best solution of the whole difficulty. At any rate, it is worthy, in my opinion, of thorough investigation and consideration. If adopted and carried out, it would insure the purity of our drinking water for all time to come. It would remove the hazard of the destruction of our pumping works, and the cutting off of our supply of water when most needed, as was the case in the great fire of 1871, and it would enable us to control and regulate our sewerage system properly. One thing in this connection is imperative: there must be a speedy increase of our facilities for supplying water. Under the growth of the City, and the various demands for it, including those for mechanical uses, we are rapidly nearing the point of inability to meet the needed supply, and, therefore, we cannot postpone much longer the procuring and use of additional pumping engines. I would respectfully impress this important fact upon the City Council.

THE WATER COLLECTION DEPARTMENT.

The new system, embracing a registry of all payments, with complete checks and daily balances, has now been fairly tested, and works well, as the results prove. With thorough clerks, trained to accuracy, it would be perfect; but simply the ability to write a fair hand does not constitute an accountant, and without that systematic accuracy which is only attained by thorough training, mistakes and blunders occur, requiring time and patience to correct, and which would throw around the simplest and most complete system of accounts ever invented an appearance of complication and difficulty. This, however, only increases the necessity for some standard or test of accuracy which must be applied each day, and we have accomplished this by the requirement in the Water Office of complete balances all around at the close of each day's business.

It would be a great improvement, and a convenience both to the people and to the employes in the office, if the law were so changed as to allow the different divisions of the City (South, West, and North), to pay in different months, thus avoiding the rush and pressure of all paying during the same month.

The plan of giving premiums for prompt payment, in lieu of imposing penalties for tardiness, works admirably, and is a happy change for all concerned. Instead of employing a large number of collectors to harrass the people for water rents, and whose salaries were paid from the water fund, we have dispensed with these, and, by allowing ten per cent. premium for prompt payment, the people avail themselves of this, and, by bringing the money to the Water Office, save to themselves the expense heretofore borne by them for the employment of numerous collectors, as well as a considerable sum besides, which the City is enabled to dispense with, through the better working of the new system. In proof of the improvement claimed, I submit the following comparative estimates:

Amount collected in Water Office during the years

1879 and 1880, less expense of collecting same. \$1,679,730 33

Reduction in amount collectable, being 25 per

cent. on frontages, commencing May 1st, 1879, 254,870 00

Also percentages deducted in 1880, for prompt

payments 39,767 00

Amounting to \$1,974,367 33

Amount collected in Water Office during the years

1877 and 1878, less the expense of collecting

same, and including the ten per cent. penalties

imposed and collected for tardiness in payment. \$1,725,586 62

\$248,780 71

Deduct the new assessments under the growth of

the City, added to the books of 1879 and 1880,

and not upon previous books, about 35,000 00

Shows a difference and saving to the people in the

two years 1879 and 1880, as compared with

the two previous years, to wit, 1877 and 1878, of \$213,780 71

VIADUCTS.

The question of Viaducts is eliciting much attention and earnest thought among our citizens; many new Viaducts are needed, thousands of people are put to daily inconvenience and loss of time because of the hindrance of passing trains. The crossings at many points are attended with much danger, and the present condition of the City in this regard is very far from being satisfactory. The City Council in former years exercised but little thought or foresight in the matter, the franchises granted to the various Railroad Companies at an early day, in some cases, contain nothing upon the subject of Viaducts, while in others the provisions are so vague and indefinite as to be of no practical benefit to the City.

The necessity for the construction of a number of new and substantial Viaducts in the City is apparent, while the question as to who should build them, and upon whom the burden should rightfully rest for their construction and maintenance, is one that is assuming very grave proportions; the needed outlay is very large, it is necessitated wholly by the presence of the railroads. The people of the City are already heavily taxed to meet the necessary and legitimate expenses of the municipal government. Our streets need large outlays to bring them to a satisfactory state of improvement. Our sewerage and water systems are far from complete, while many other heavy expenses incident to the proper management and control of a large City, must necessarily be met and provided for by continuous taxation. In view of these facts, if a large share of the expense required to build the needed Viaducts and to maintain them, be added, it will so materially increase the burden, as to make this item of City taxation a very unpopular one, especially when all the facts and equities surrounding the question shall be duly weighed and considered. No uniform rule concerning Viaducts, as applied to the several railroad companies, has ever been adopted, nor has any definite settlement of the question been agreed upon and determined. It is therefore yet an open question, and the

sooner it is settled upon a just and equitable basis, the better for the City.

Heretofore, in the absence of any settled rule or definite law to govern, in building Viaducts the city authorities have been left in most cases to make such terms as they could with the railroad companies interested, for such portion as they would consent to pay, of the expense in the erection of a new Viaduct, without any agreement for keeping it in repair, or for replacing it when it should be worn out. To show the proportions which have thus been paid, I append here a table of eleven of the leading Viaducts, showing the time when built, the cost of each, and the amounts paid in each case by the City and by the railroad companies respectively.

COST OF VIADUCTS.

WHEN BUILT.	NAME.	PAID BY CITY.	PAID BY R. R's.	TOTAL.
1871.	Erie Street Viaduct.....	\$ 23,056 25		\$ 23,056 25
1872.	Wells Street Viaduct	12,570 65		12,570 65
1870.	Van Buren Street Viaduct	7,715 56		7,715 56
1870.	Adams Street Viaduct	25,883 87	\$ 19,000 00	44,883 87
1872.	Clark Street Viaduct.....	24,277 43	14,730 00	39,007 43
1873.	Canal Street Viaduct.....	30,000 00	96,401 29	126,401 29
1873.	Twelfth Street Viaduct	7,549 62	25,668 25	33,217 87
1874.	N. Halsted Street Viaduct	65,477 46	65,357 81	130,835 27
1875.	Blue Island Ave. Viaduct	74,201 34	22,126 80	96,328 14
1876.	Milwaukee Ave. Viaduct.....	154,901 86	76,147 85	231,049 71
1878.	Eighteenth Street Viaduct.....	19,842 82	14,000 00	33,842 82
		\$445,476 86	\$333,432 00	\$778,908 86

In the above showing it is seen that in an aggregate expenditure for Viaducts of nearly \$800,000, the City has paid about four-sevenths, and the railroads three-sevenths of the outlay. With the

SANGAMON STREET VIADUCT,

now in process of construction, the estimated cost complete is \$86,000, of which the railroad companies are to pay \$57,000, or about two-thirds of the expense, while the City is to pay \$29,000, a little over one-third of the expense. This Viaduct is a substantial structure, and will soon be completed.

In the latter part of the year (1880) we concluded an agreement with the several railroad companies interested, for the building of a substantial

VIADUCT AT HARRISON STREET,

the estimated cost of which is as follows:

For Approaches	\$ 30,622 59
" Sub-structure	7,101 85
" Super-structure	49,875 00
" Raising buildings	18,625 00
Total estimated cost	\$106,224 44

Of this the railroads have agreed to pay as follows:

In part for approaches	\$5,730 74
For Sub-structure	7,101 85
For Super-structure	49,875 00
In part for raising buildings	14,625 00
Total	\$ 77,332 59

Leaving the City to pay as follows:

In part for approaches	\$24,891 85
In part for raising buildings	4,000 00
Total	\$ 28,891 85

Thus meeting the whole estimated cost as above	\$106,224 44

Under this agreement the railroad companies interested are to pay about eight-elevenths of the whole expense, leaving the City to pay about three-elevenths. If the expense for this Viaduct should exceed the above estimates, the agreement is, that the excess shall be borne in like proportions respectively, and if the expense should be less, the same rule is to apply. It will be observed that this is a very favorable arrangement for the City, compared with former apportionments in such cases between the

City and the railroad companies. The contracts for this work have been let, and the structure will probably be completed and opened to the public by the first of August next.

For full and interesting details and estimates concerning the Viaducts and Bridges of the City, see the City Engineer's report herewith accompanying.

I am much indebted to this officer for his faithful and efficient services; his earnest coöperation in all matters pertaining to the City's interest has aided me greatly in the management of the department during the year.

NEW CITY HALL.

Building operations commenced about the first of April, and, in consequence of arrangements made with the stone contractors, enabling them to cut the stone during the winter months, it was hoped the building would have been ready for the roof by the beginning of last November. Unfortunately, during the summer two of the derricks were broken, which caused a delay of about four weeks before they could be replaced. Notwithstanding this, it was still hoped that the building would be ready for the roof before it would be necessary to suspend the work for the winter. Our seasons generally permit work to be continued till about the beginning of December, but last year severe frost set in about the beginning of November, and we were forced to suspend work when three weeks more would have made the building ready for the roof.

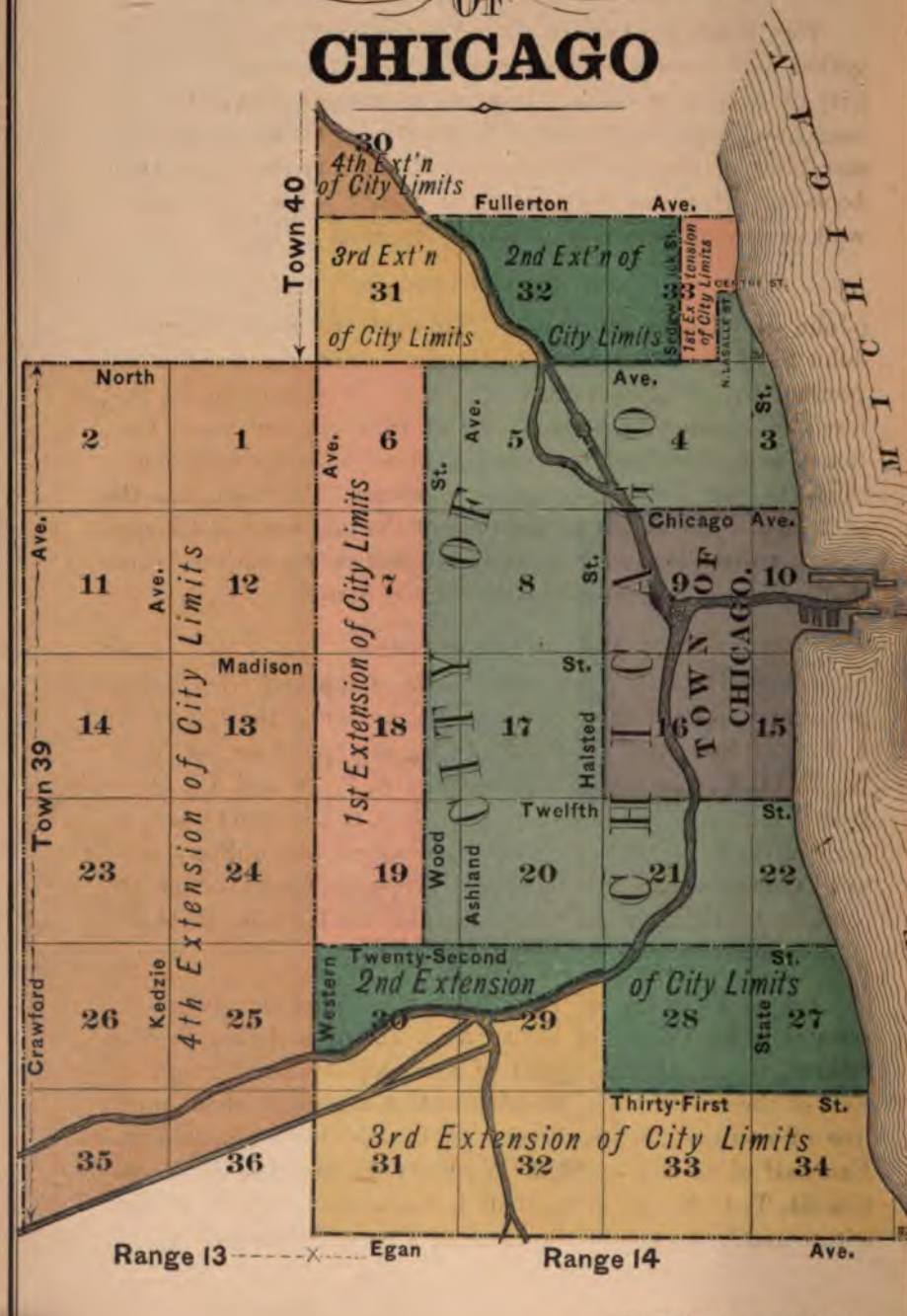
The contract is let for the fire-proof roofing and flooring. The tiles for the roofing are already on the ground, and there will, therefore, be no delay in having the building roofed as soon as it is ready for the roof.

It is intended during this season to push the work so that during next winter it may be continued, and, by the fall of 1882, at latest, the City may occupy the building.

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CITY LIMITS OF CHICAGO



THE GROWTH OF CHICAGO.

The following important and interesting memoranda, together with the accompanying map, showing the growth of the City of Chicago from a village to its present dimensions, has been hunted up and furnished me by Mr. F. C. Meyer, the former head of the map department of the city, and now chief book-keeper of the Department of Public Works. I think it well worthy of preservation and of insertion here.

THE "TOWN OF CHICAGO,"

(John H. Kinzie, Gurdon S. Hubbard, Ebenezer Goodrich, John K. Boyer and John S. C. Hogan, first trustees), was incorporated by act of February 11, 1835. It comprised all that territory covered by sections 9 and 16, north and south fractional section 10, and fractional section 15, in town 39 north, range 14 east of the 3d principal meridian, "Provided, that the authority of the Board of Trustees of the said town of Chicago shall not extend over the south fract'l section 10, until the same shall cease to be occupied by the United States."

THE "CITY OF CHICAGO,"

incorporated by act of March 4, 1837, comprised "the district of country in the County of Cook, &c., known as the E. $\frac{1}{4}$ of the S. E. $\frac{1}{4}$ of Sec. 33, T. 40 N., R. 14 E., and fract'l sec. 34, T. 40 N., R. 14 E., also the E. $\frac{1}{4}$ of sections 6, 7, 18 and 19, all of fract'l section 3, and of sections 4, 5, 8, 9, and fract'l sec. 10 (except the S. W. fract'l $\frac{1}{4}$ thereof, occupied as a military post, until the same shall become private property), fract'l section 15; sections 16, 17, 20, 21, and fract'l section 22, T. 39 N., R. 14 E."

FIRST EXTENSION OF CITY LIMITS.

Act of February 16, 1847, provides: "That the district of country in the County of Cook (&c.), known and described as follows, to wit: All that part of township 39 north, range 14 East of the 3d Principal Meridian, which lies north of the north line of sections 27, 28, 29 and 30 of said township, and the East half of Section 33, T. 40 N., R. 14 E., and fractional section 34, T. 40 N., R. 14 E., shall hereafter be included in, constitute and be known by the name of City of Chicago."

SECOND EXTENSION OF CITY LIMITS.

Act of February 12, 1853, provides: "That the corporate limits and jurisdiction of the City of Chicago shall be and the same are hereby extended as to embrace and include within the same the several tracts of land hereinafter described, which shall be deemed parts of the divisions of the said City named in connection therewith, as follows:

North Division: All those parts of sections 31 and 32, T. 40 N., R. 14 E., lying east of the centre of the north branch of the Chicago River, and the W. $\frac{1}{2}$ of Sec. 33 in same Township and Range.

South Division: All of fractional section 27, T. 39 N., R. 14 E., and so much of the shore and bed of the lake as lies within one mile east of said section, and all of that part of section 28, same township and range, lying south and east of the south branch of the Chicago River.

West Division: All those parts of sections 28, 29 and 30, T. 39 N., R. 14 E., lying north of the south branch of the Chicago River."

THIRD EXTENSION OF CITY LIMITS.

Act of February 13, 1863, provides: "The corporate limits and jurisdiction of the City of Chicago shall embrace and include within the same all of Township 39 N., R. 14 E. of 3d P. M., and all of sections 31, 32, 33, and fract'l section 34, T. 40 N., R. 14 E., together with so much of the waters and bed of Lake Michigan as lies within one mile of the shore thereof, and east of the territory aforesaid."

FOURTH EXTENSION OF CITY LIMITS.

Act of February 27, 1869, provides: "That the territorial limits of the City of Chicago shall be and are hereby extended as follows: That part of Sec. 30, T. 40 N., R. 14 E., which lies west of the North Branch of the Chicago River; sections 1, 2, 11, 12, 13, 14, 23, 24, 25, 26, and that part of sections 35 and 36 lying northwest of the centre of the Illinois and Michigan Canal, all in Township 39 N., R. 13 East, shall be and are hereby added to the City."

PARKS.

The principal public parks under the control of this department are twelve in number, namely: Lake Park, Union Park, Jefferson Park, Wicker Park, Vernon Park, Ellis Park, Washington Square, Dearborn Park, Congress Park, Union Square, Campbell Park, Aldine Square.

LAKE PARK

Embraces 41 acres, is bounded by Randolph street, Lake Park Place (Park Row), Michigan avenue, and the Illinois Central Railroad lands. That part south of Madison street was dedicated as "public grounds" by the Canal Commissioners on their plat of fractional section 15, recorded July 20, 1836, while the northern portion is shown on the record of Fort Dearborn Addition, made by the U. S. Government in 1839.

UNION PARK

Was acquired by purchase from S. S. Hayes, W. S. Johnston Sam'l L. Baker, and others, in December, 1853, and February, 1854. It contains $14\frac{8}{10}$ acres, and is bounded by W. Lake street, Bryan Place, Ogden avenue, Warren avenue and Ashland avenue.

JEFFERSON PARK

Was purchased from L. D. Boone, administrator of the estate of Jesse B. Thomas, in 1850, contains about $5\frac{1}{2}$ acres, and is located between Loomis and Throop, and W. Monroe and W. Adams streets.

WICKER PARK,

A triangular piece of ground, bounded by N. Robey street, Fowler street and Park street (or Wicker Court.) It is shown as "Wicker Park" in D. S. Lee's Addition to Chicago, recorded July 16, 1868, and covers an area of four acres.

VERNON PARK,

Donated to the City by Henry D. Gilpin, October 17, 1859, embraces very nearly four acres, and is bounded by Macalester Place, Gilpin Place, Sibley street and Lytle street.

ELLIS PARK

Was dedicated to the City by Samuel Ellis, March 21, 1855; contains $3\frac{3}{4}$ acres, and lies between Vincennes and Cottage Grove avenues, and north of 37th street.

WASHINGTON SQUARE,

With an area of about $2\frac{1}{4}$ acres, was donated by O. Bushnell and others, September 14, 1842, and is bounded by Lafayette Place on the north, Washington Place on the south, N. Clark street on the west and Dearborn avenue on the east side.

DEARBORN PARK,

Lying east of Dearborn Place, west of Michigan avenue, south of Randolph, and north of Washington street, is shown on the recorded plat of Fort Dearborn Addition as "Public Ground," said addition being recorded by the Secretary of War, in 1839.

CONGRESS PARK

Was dedicated by F. W. and Jas. L. Campbell, in their subdivision of lots 13 to 24 of Block 4, Rockwell's Addition to Chicago, recorded April 8, 1873. It has an area of $\frac{7}{10}$ of an acre, and is situated between W. Van Buren and W. Harrison streets, about 200 feet west of Rockwell street.

UNION SQUARE

Was donated by H. O. Stone, in his subdivision of Astor's Addition, contains about $\frac{1}{2}$ acre, and forms the north-west quarter of a block bounded by Goethe, Scott, Astor and Stone streets.

CAMPBELL PARK,

Containing about $\frac{1}{2}$ acre, is located between Woodbine Place and Evergreen Place, and extends from Leavitt street to Oakley avenue. It was dedicated July 28, 1871, as a public park, by F. W. and Jas. L. Campbell, in their subdivision of Block 2 of Morris and others' subdivision of W. $\frac{1}{2}$ S. W. $\frac{1}{4}$ Sec. 18, T. 39 N., R. 14 E.

ALDINE SQUARE

Is situated in the N. $\frac{1}{2}$ of Block 3, of Ellis' West Addition, about 300 feet south of 37th street, extending from Vincennes avenue west a distance of 330 feet. It was made a public park by the owner, and recorded as such April 26, 1875.

THE LARGER PARKS.

Besides the foregoing, there are the following public parks in the City and its suburbs, which are under the management of Park Boards, to wit:

	ACRES.
Lincoln Park	250
Humboldt Park	200
Central Park	185
Douglas Park	180
South Park	372
Lake Shore Park	593

When completed, in conformity with the plans adopted by the respective Park Boards, the number of miles of drives in these Parks and along the Boulevards connecting therewith, will be as follows:

	MILES.
Lincoln Park	$3\frac{1}{2}$
Humboldt Park	$3\frac{1}{8}$
Central Park	4
Douglas Park	$2\frac{1}{2}$
South Park	$3\frac{3}{4}$
Midway Division	1
Lake Shore Park	5
	— $23\frac{1}{2}$

BOULEVARDS.

Lake Shore Drive (north to Belmont avenue)	$2\frac{3}{4}$
West Washington street, from Halsted street to Central Park	$3\frac{1}{4}$
Michigan avenue, from Jackson street to Douglas avenue, thence to Grand Boulevard	$3\frac{3}{4}$
Humboldt Boulevard	3

	MILES.
Central Boulevard	1 $\frac{1}{2}$
Douglas Boulevard	1 $\frac{3}{4}$
From Douglas Park to Western avenue, and along Western avenue to Illinois and Michigan Canal..	1 $\frac{1}{8}$
Western avenue, from Illinois and Michigan Canal to 55th Street, thence to the South Park.....	6 $\frac{3}{8}$
Oakwood Boulevard	$\frac{1}{2}$
Grand Boulevard	2
Drexel Boulevard	1 $\frac{1}{2}$
	28 $\frac{1}{4}$
Total miles of drives in Parks and Boulevards,	51 $\frac{1}{8}$

MISCELLANEOUS DATA.

Chicago covers an area of nearly 36 square miles, or 23,040 acres. There are 789 acres in the public parks, 385 acres in the river, its branches, the slips and the Illinois and Michigan canal. The streets of the city measure 651 miles, are known by 907 names, and cover 5,200 acres. About 153 miles of the streets are paved (principally with wooden blocks). There are 756 miles of sidewalks, 337 miles of public sewers, and 459 $\frac{1}{2}$ miles of water pipes (mains). There are about 29 miles of river frontage (counting both sides), and 12 miles of slips and basins, making 41 miles of water frontage in the inner harbor. There are 32 bridges in the city, that cost an average of about \$25,000 each, and 18 viaducts, ranging in cost from \$6,000 to \$230,000 each.

CONCLUSION.

In conclusion, I can only repeat what I distinctly stated in my last annual report, and what another year's experience has only the more thoroughly convinced me of, that the Department of Public Works, if managed in the most successful manner for the best interests of the whole City, should be conducted on strictly business principles. It is eminently a working department, having nothing whatever to do with politics, or the

intrigues of political parties. Its employes therefore should be selected for their qualifications and fitness for the place which they are expected to fill, and with an eye single to the public good; earnest, competent, faithful men, who will take a pride in doing their whole duty, and who will protect such interests of the City as are confided to them, with precisely the same care as they would their own.

Not a man more than the City actually needs should ever be employed, and none should be retained that are incompetent, insubordinate, unfaithful, intemperate, or from any other cause unprofitable to the City. I hold these views honestly and firmly.

For detailed statements showing the work of this department throughout the year 1880, and for other interesting information and statistics, I refer you to the accompanying reports of the several heads of sub-departments.

Respectfully submitted,

CHARLES S. WALLER,

Commissioner of Public Works.

BOOK-KEEPER'S REPORT.

CHICAGO, DECEMBER 31, 1880.

CHAS. S. WALLER, ESQ.,

Commissioner of Public Works.

Dear Sir:—I present herewith the annual report of receipts and expenditures in detail, on account of the various funds pertaining to your department from January 1, to December 31, 1880.

WATER FUND.

RECEIPTS.

On acc't Current Rents:

Am't collected during the year.....	\$857,409 25
--	--------------

On acc't Delinquent Rents:

Am't collected through Water Office.....	\$ 1,967 47
Am't collected by City Collector.....	992 65
	2,960 12

On acc't Penalties:

Am't received during the year.....	5,248 98
---------------------------------------	----------

On acc't Water Pipe Extension:

Am't received for labor and material furnish- ed private parties, in connection with lay- ing water pipes for elevators and other purposes, and for castings and scrap- iron sold.....	28,926 81
--	-----------

Am't carried forward.	
	\$894,545 16

Am't brought forward..	\$894,545 16	
<i>On acc't Water Meters:</i>		
Am't received during the year from private parties for meters, fit- tings, and labor set- ting same.....		10,728 43
<i>On acc't North Pumping Works:</i>		
For castings sold....	\$16 70	
For labor for Street Department.....	32 84	
For labor and material furnished for testing engines at Fullerton Avenue conduit.....	14 74	
		64 28
<i>On acc't West Pumping Works:</i>		
For waste oil and old barrels sold.....		32 00
<i>On acc't Water Service Cocks:</i>		
Am't received during the year for tapping and plumbers' licenses...		7,448 95
<i>On acc't Water Works Repairs:</i>		
Am't received during the year for letting on and shutting off water		1,045 10
<i>On acc't Water Works Shops:</i>		
For castings sold.....	\$675 64	
For labor on old City Hall.	13 60	
For labor and material fur- nished Street Depart- ment.....	151 24	
For repairing derricks for Sewerage Depart- ment.....	74 88	
Am't carried forward.	\$915 36	\$913,863 92

Am't brought forward..	\$915 36	\$913,863 92
For labor and material		
repairing bridges....	408 15	
For making tools for		
sounding river.....	23 23	
		1,346 74

On acc't Fire Hydrants:

For damage done to		
hydrants, and from		
private parties for set-		
ting hydrants.....		205 34

On acc't Miscellaneous Receipts:

Money advanced by pri-		
vate parties to lay		
water-pipe.....	\$4,250 00	
Am't received from City		
Comptroller for tax-		
purchases.....	325 73	
From Office Expense and		
Salaries refunded...	238 33	
From E. M. Johnson,		
bookkeeper.....	500 00	
From John Hise, Cashier.	50 10	
		5,364 16

On acc't Lake Tunnel Crib:

For old iron sold.	5 00	
		\$920,785 16

EXPENDITURES.

On acc't North Pumping Works:

For Coal.....	\$44,086 95
Labor.....	21,374 93
Oil.....	756 09
Gas.....	1,077 12
Repairing machinery	259 65
Am't carried forward.	\$67,554 74

Am't brought forward..	\$67,554 74	
Repairing building..	95 00	
Teaming.....	78 00	
Lead, iron and cast- ings.....	242 07	
Lumber.....	65 07	
Pails, brooms, soap and tallow.....	106 45	
Waste, gasket and packing.....	235 71	
Blank books.....	9 01	
Cement.....	5 15	
Plumbing.....	6 25	
Hardware.....	38 33	
Engine register and gauge glasses.....	61 94	
3 Lubricators.....	95 00	
Chain, cordage and twine.....	33 80	
Shovels.....	68 17	
Advertising.....	26 00	
Ice.....	17 15	
		68,737 84

On acc't West Pumping Works:

For Coal.....	\$18,567 09	
Labor.....	20,096 34	
Oil.....	1,359 95	
Gas.....	957 74	
Repairing machinery	366 96	
Repairing building..	315 30	
Hardware.....	130 53	
Soap and brooms...	104 75	
Steam fitting.....	303 69	
Rubber valves.....	493 92	
Fire-brick and tile..	461 95	
Am't carried forward.	\$43,158 22	\$68,737 84

Am't brought forward..	\$43,158 22	\$68,737 84
Iron work.....	289 87	
Lumber.....	68 96	
Pipe and repairs....	57 27	
Waste, gasket and packing.....	361 62	
Grease.....	113 10	
Ice.....	53 62	
Advertising.....	26 00	
Water heater.....	198 00	
Castings.....	94 40	
Rope, cordage and twine.....	43 11	
Vitriol.....	7 20	
Cement.....	3 55	
Coke.....	9 00	
Shovels.....	13 63	
Gauge glasses.....	18 50	
Hose pipe.....	14 82	
1 gate valve.....	4 25	
Lamps.....	3 70	
Repairing tools....	16 59	
		44,555 41

*On acc't Water Office Expense
and Salaries:*

For Salaries.....	\$45,440 42	
Advertising.....	348 89	
Atlas.....	22 00	
Gasfitting.....	76 71	
Rent of telephones..	107 50	
Hardware.....	34 89	
Stationery.....	717 14	
$\frac{1}{8}$ of cost of 6 direc- tories.....	10 00	
Printing blanks....	444 98	

Am't carried forward..\$47,202 53 \$113,293 25

Am't brought forward..\$47,202 53 \$113,293 25

Blank books.....	852 58	
Furniture.....	160 62	
Binding books and vouchers.....	74 53	
Examining accounts.	312 50	
Matches	14 00	
$\frac{1}{8}$ cost lithographing for annual report.	64 66	
$\frac{1}{8}$ cost printing annual report.....	259 00	
Spindle-stand and files.....	6 55	
Counterfeit detector	2 00	
Use of horse and wagon.....	6 00	
1 Coin-tray	10 75	
Postal cards.....	376 45	
Postage stamps.....	158 67	
Car fares.....	322 00	
Sharpening erasers..	3 20	
$\frac{1}{8}$ Salary of Commis- sioner, etc.	3,433 32	
		\$53,259 36

On acc't Water Works Shops:

For gas.....	\$33 67
Packing and gasket.	246 92
Steam jet tubes.....	12 00
Ice.....	2 00
Castings	6,621 15
Coal.....	76 40
Drills.....	6 00
Repairs of boiler...	37 98
Brass valves.....	80 05
Labor.....	7,707 57

Am't carried forward.\$14,823 74 \$166,552 61

Am't brought forward..	\$14,823 74	\$166,552 61
For hydrant wrenches ..	20 40	
For iron, steel, brass and zinc	577 36	
For bolts, nuts and gen- eral hardware.....	293 88	
For potash.....	1 15	
For rubber and hose...	312 22	
For steam fitting.....	4 32	
For oil and lead	36 29	
For lumber	40 50	
For files.....	8 90	
For felt	2 36	
For belting	3 16	
		\$16,124 28

On acc't Water Works Stables:

For horse feed.....	\$506 64	
For labor.....	498 00	
For horse-shoeing and blacksmithing	115 85	
For repairing harness...	66 20	
For axle grease.....	1 50	
For lumber	9 60	
For medicine and attend- ance.....	16 75	
For rope and cordage...	20 25	
		\$1,234 79

On acc't Water Pipe Extension:

For labor.....	\$59,214 39	
For hauling water pipe .	3,957 83	
For iron water pipe	124,610 20	
For sewer pipe	1,290 36	
For plumbing	995 00	
For advertising.....	349 21	
For castings	3,247 50	

Am't carried forward..\$193,664 49 \$183,911 68

Am't brought forward.	\$193,664 49	\$183,911 68
For cement.....	1,281 90	
For bricks.....	4,384 66	
For lumber.....	1,645 79	
For lead.....	8,811 26	
For oil and tar-pentine..	59 13	
For hardware.....	284 98	
For blacksmithing.....	29 83	
For chain, rope and cord-		
age.....	43 76	
For gasket.....	180 00	
For rigging for derrick..	40 00	
For steam fittings.....	69 56	
For damages caused by		
bursting of pipe.....	100 00	
For advances refunded		
and rebates on de-		
posits for work.....	3,169 66	
For repairing wagon...	37 76	
For lanterns and globes.	24 52	
For printing blanks.....	44 63	
For taps and plugs.....	4 25	
For brooms and pails...	8 75	
For packing.....	7 00	
For tools and sharpening		
same.....	56 54	
For sand.....	73 50	
For royalty (collected		
from private parties)	70 00	
For engraving.....	16 00	
For pulley blocks.....	31 35	
For use of stone jack...	17 50	
For one horse.....	150 00	
For powder and fuse...	42 40	
For sawdust.....	18 75	
For felt.....	51 02	

Am't carried forward.\$214,418 99 \$183,911 68

Am't brought forward.	\$214,418 99	\$183,911 68
For Harrison street tunnel (to contractor)...	7,883 50	
For Clybourne Place tunnel (built by City):		
Labor and inspecting ..	\$4,615 90	
Lanterns...	5 00	
Iron work..	147 73	
Tools.....	25 31	
Bricks.....	788 50	
Gunny sacks	2 40	
Steam fitt'gs	32 82	
Pails.....	1 50	
Oil and turpentine...	61 25	
Cement....	351 00	
Hardware..	27 20	
Hose and couplings .	14 00	
Lumber.	188 42	
Coal	268 51	
Castings ...	8 07	
Tin pipe and elbows ...	25 60	
Rent of boiler and hoisting drum.	220 00	
Slabs.....	5 00	
Rope and hemp	7 31	
Sand	4 50	
Teaming...	26 50	
Advertising.	48 90	
	6,875 42	
		229,177 91
Am't carried forward.		\$413,089 59

Am't brought forward.. \$413,089 59

On acc't of Water Works Repairs:

For lumber.....	265 64	
For labor... ..	20,154 27	
For plumbing.....	234 90	
For bricks....	763 94	
For cement.....	193 00	
For sand.....	54 00	
For hardware.....	90 22	
For painting fire hyd'nts.	153 68	
For repairing wagon....	93 70	
For repairing pipe press.	11 98	
For steam fitting.....	19 15	
For repairing pump....	6 50	
For roofing shed.....	27 95	
For 1 bench vise.....	5 00	
For repairing scales....	4 50	
For lead	10 63	
For hose	16 06	
For varnish and oil.....	16 40	
For pails	1 00	
For tape lines.....	12 50	
For 1 stove	21 75	
For repairing lanterns..	8 60	
For castings.....	5 61	
For sewer pipe	16 00	
For glazing sash	1 50	
For packing	12 04	
		22,200 52

On acc't of Water Meters:

For labor.....	\$9,999 93
For castings	664 97
For bricks.....	511 60
For tools	11 30
For meters	2,116 12

Am't carried forward.\$13,303 92 \$435,290 11

Am't brought forward..	\$13,303 92	\$435,290 11
For fittings	1,069 29	
For printing and station- ery.....	67 27	
For water gauge and glasses	19 50	
For meter covers and frames.....	234 44	
For sealing wax	4 50	
For lumber	235 80	
For horse feed	26 71	
For rebates and deposits refunded	125 58	
For packing	8 54	
For freight	170 40	
For sheet lead	8 14	
For plumbing	35 45	
For hardware	70 41	
For oil and turpentine..	3 00	
For meter counters.....	172 00	
For matches	8 50	
For repairing harness ..	28 10	
For rubber stamp.....	1 75	
For candles	7 20	
For repairing wagon....	40 80	
For sand.....	71 25	
For sawdust	66 00	
For cement.....	191 50	
		15,970 05

On acc't Fire Hydrants:

For labor.....	\$9,690 84
For sawdust	202 25
For lumber	1,149 65
For cement.....	386 60
For painting plugs.....	379 87
For bricks.....	628 00

Am't carried forward.\$12,437 21 \$451,260 16

Am't brought forward..	\$12,437 21	\$451,260 16
For felting	98 28	
For oil	45 45	
For sand	41 25	
For sewer pipe	24 00	
For hardware	10 00	
For pitch	7 90	
		12,664 09

On acc't Lake Tunnel Crib:

For labor (inclu'ng keep- er's salary)	\$1,770 10	
For use of tug	785 50	
For coal and towing	185 25	
For lanterns, oil and paint.	84 99	
For 1 boat	48 50	
For oil tank	10 25	
For bedding	14 90	
For oakum	8 23	
For slabs	11 00	
For scoops and general hardware	20 00	
For rope	10 14	
For lumber	5 62	
For brass rods	4 00	
For cement	3 85	
For oars	12 68	
For vitriol	5 00	
For belting	3 25	
For advertising	63 56	
For stationery	1 50	
		3,048 32

On acc't Water Works Income:

For am't refunded sun- dry persons where pay- ment of water tax had been made twice	490 92	
A'mt carried forward.		\$467,463 49

Am't brought forward.. \$467,463 49

On acc't Water Service Cocks:

For labor.....	\$4,888 28	
For corporation taps ...	2,391 14	
For covers for stop cocks	775 00	
For 2 horses.....	250 00	
For advertising.....	190 87	
For repairing wagon....	58 05	
For lumber.....	21 72	
For hardware	21 24	
For use of horse and wagon	12 00	
For horse medicine ...	5 00	
For chain	2 30	
		8,615 60

On acc't Water Loan Interest:

For coupons paid by City Treasurer.....	\$45,070 00	
For amount remitted to American Exchange Nat'l B'k, N. Y., for payment of coupons.	237,803 03	
		282,873 03

On acc't Water Loan Bonds:

For 17 \$1,000 bonds (6%) paid by City Treasu'r	\$17,000 00	
For amount remitted to American Exchange Nat'l B'k, N. Y., to retire 274 \$1,000 Wa- ter Loan Bonds, 6%.	274,000 00	
		291,000 00

On acc't Pumping Lake Tunnel:

For Labor.....	\$433 07
For iron and hardware..	8 40

Am't carried forward. \$441 47 \$1,049,952 12

Am't brought forward . .	\$441 47	\$1,049,952 12
For pipe and fitting	17 41	
For lumber	65 79	
		524 67
<i>On acc't Henry Barker & Co.:</i>		
For money advanced by them to lay water- pipe, refunded	481 22	
		\$1,050,958 01
Expenditures exceeding receipts		\$130,172 85

NOTE.—The excess of expenditures over receipts is caused by the retiring of 291 \$1,000 bonds payable July 1, 1880. But for this large extra expenditure, the receipts would be \$160,827.15 over expenditures.

SEWERAGE FUND.

RECEIPTS.

<i>On acc't House Drains:</i>		
Amount rec'd for drain permits and drain- layers' licenses	\$16,082 65	
<i>On acc't Maintenance of Sewers:</i>		
Amount appropriated by City Council	85,880 68	
<i>On acc't Miscellaneous Receipts:</i>		
Amount rec'd from con- tractors for cleaning sewers	\$102 62	
Amount transferred from Sewerage Tax Fund, for lithographing and printing new (4½%) sewerage bonds, ch'gd Sew'age Fund in error	400 00	
Am't carried forward.	\$502 62	\$101,963 33

Am't brought forward..	\$502 62	\$101,963 33
Amount transferred from		
Water fund for two		
months' salary of mes-		
senger, charged Sew-		
erage Fund in error.	50 00	
		552 62
		\$102,515 95

EXPENDITURES.

On acc't Sewerage Office Expense:

For stationery and draw-		
ing material	\$389 60	
Printing, blank b'ks,		
and binding	246 88	
Postage stamps and		
postal cards	167 00	
Car fares	290 91	
Office furniture	57 85	
Printing part of atlas	22 00	
Advertising	19 20	
One-third cost of six		
directories	10 00	
Amount refunded for		
permits	10 00	
One-third cost lith-		
ographing for an-		
nual report	64 67	
One-third cost print-		
ing annual report.	259 00	
Locksmithing	1 80	
Glycerine	1 93	
Lithographing and		
printing new bonds	400 00	
Messengers' salary..	25 00	
		\$1,965 84
Am't carried forward.		\$1,965 84

Am't brought forward.. \$1,965 84

On acc't Sewerage Department:

Salaries:

For salaries pd. employes. \$13,327 63

One-third salaries of

Commissioner, Sec-

retary, Bookkeeper,

etc..... 3,458 28

16,785 91

On acc't J. P. Miller, Contractor:

For teaming in connection

with maintenance

of sewers.....

5,845 74

On acc't Repairs of Sewers N. Division:

For labor..... \$475 22

Bricks..... 79 46

Iron covers..... 1,146 60

Cement..... 45 65

Lumber..... 3 15

1,750 08

On acc't Repairs of Sewers S. Division:

For labor..... \$674 37

Iron covers..... 1,366 90

Pipe..... 10 01

Bricks..... 79 47

Cement..... 45 65

Oil..... 1 60

Lumber..... 3 15

Rubber goods..... 2 00

2,183 15

On acc't Repairs of Sewers W. Division:

For labor..... \$2,243 82

Iron covers..... 2,246 86

Cement..... 48 91

Am't carried forward. \$4,539 59 \$28,530 72

Am't brought forward..	\$4,539 59	\$28,530 72
For Bricks.....	79 47	
Rubber goods.....	24 19	
Oil	2 00	
Lumber.....	61 01	
Stone.....	4 72	
		4,710 98

On acc't Cleaning Sewers N. Division:

For labor.....	\$5,326 24	
Candles.....	8 45	
Axle grease.....	40	
		5,335 09

On acc't Cleaning Sewers S. Division:

For labor... ..	\$8,838 72	
Candles.....	5 00	
Lumber.....	10 14	
		8,853 86

On acc't Cleaning Sewers W. Division:

For labor.....	\$11,358 06	
Candles.....	5 30	
Rubber goods.....	4 27	
Oil	3 15	
Axle grease.....	1 75	
		11,372 53

On acc't Street Intersections:

For labor.....	\$5,743 91	
Bricks.....	1,120 00	
Cement.....	659 20	
Covers	2,572 10	
Pipe	480 55	
Oil	2 40	
		10,578 16

On acc't House Drains:

For labor.....	\$5,838 12	
Pipe	10,786 78	
Am't carried forward..	\$16,624 90	\$69,381 34

Am't brought forward..	\$16,624 90	\$69,381 34
For Advertising	100 40	
Plumbing	10 00	
		16,735 30

On acc't Stock :

For tools and repairs...	\$237 40	
Hose and couplings.	736 45	
Engineers' instrum'ts		
and repairs	79 49	
Lumber	148 64	
Pails	51 00	
Repairs of wagons..	26 21	
Hardware	180 63	
Reflectors	1 20	
Rubber boots	5 50	
Rope	11 31	
Lanterns	13 50	
		1,491 33

On acc't Sinking Fund :

For amount transferred to		
Sewerage Sinking		
Fund for 1879...	\$500 00	
Amount transferred		
to Sewerage Sink-		
ing Fund for 1880.	500 00	
Amount transferred		
to River Improve-		
ment Sinking Fund		
for 1879	500 00	
Amount transferred		
to River Improve-		
ment Sinking Fund		
for 1880	500 00	
		2,000 00
		\$89,607 97
Receipts over Expenditures		\$12,907 98

SEWERAGE TAX FUND.

RECEIPTS.

On acc't Construction of New Sewers :

Amount appropriated by

City Council.....\$220,000 00

From private parties, money
advanced for build-

ing sewers..... 6,477 50

\$226,477 50*On acc't Sewerage Loan Bonds:*

(4½ %):

From sale of 490 \$1,000

bonds..... 490,000 00

On acc't Premium:

From Corn Exchange Na-

tional Bank for 2⅞%

% premium on 4½ %

bonds..... 9,947 00

On acc't Cement :

For cement sold \$9 10

Cement used by Street

Department..... 308 75

Amount receiv'd from

Sewerage Fund for

cement used in re-

pairs 796 16

1,114 01*On acc't Pipe :*

For pipe sold \$83 14

Amount receiv'd from

Sewerage Fund for

pipe used on house

drains..... 11,277 34

11,360 48

Am't carried forward.

\$738,898 99

Am't brought forward..		\$738,898 99
<i>On acc't Bricks :</i>		
For bricks sold.....	\$164 15	
From Water Fund for bricks furnish'd Wat'r Department.....	1,184 00	
From Sewerage Fund, for bricks furnished....	1,358 40	
		2,706 55
<i>On acc't Iron Covers :</i>		
For Iron Covers sold...	26 17	
From Sewerage Fund, for covers furnished for repairs.....	4,760 36	
		4,786 53
<i>On acc't Wooden Covers :</i>		
From J. S. Surdam & Co., reduction on nails...	8 75	
From Sewerage Fund, for covers used on street intersections	2,572 10	
		2,580 85
<i>On acc't Catch Basins :</i>		
From Chic. & West. Ind. R. R. Co., for con- structing catch-basins and man-holes		1,148 60
<i>On acc't Miscellaneous Receipts :</i>		
From Water Fund, am't transferred to pay contractor for delay in removing water- pipe in the way of sewers	102 00	
From salaries refunded.	58 34	
		160 34
		\$750,281 86

EXPENDITURES:

On acc't Sewers North Division :

Paid Contractors for labor \$7,217 56

" Contractor for team-
ing 855 37

For engineering and in-
specting 1,776 90

Bricks used 1,737 60

Cement used 601 12

Covers used 346 80

Pipe used 14,717 23

Catch-basins built . . . 385 89

Sand used 45 78

Labor 185 45

Advertising 25 74

Repairing derricks . . . 24 96

Plumbing, where wa-
ter service pipes
had to be cut and
reconnected 88 41

 \$28,008 81
On acc't Sewers South Division :

Paid Contractors for labor 24,362 96

Contractor for team-
ing 706 45

For engineering and in-
specting 2,453 90

Bricks used 14,208 08

Cement used 5,280 23

Covers used 1,109 20

Pipe used 3,812 34

Sand used 63 22

Catch-basins built . . . 2,932 85

Hardware used 21 09

Advertising 28 54

 Am't carried forward. \$54,978 86 \$28,008 81

Am't brought forward ..	\$54,978 86	\$28,008 81
For Labor	655 83	
Repairing derricks..	24 96	
Refund'g A. A. Dewey money adv'e'd.	70 00	
Refunding Jacob Rosenberg money advanced	151 10	
Plumbing, where water service pipes had to be cut and reconnected	484 75	
		\$56,365 50

On acc't Sewers West Division :

Paid Contractors for labor	30,122 07	
" Contractor for teaming	1,479 80	
For engineering and inspecting	4,484 55	
Refunding O. G. Gibbs money advanced	28 50	
Refunding M. R. Good money advanced	55 00	
Refunding J. R. Payson money advanced	55 00	
Bricks used	29,676 52	
Covers used	2,378 00	
Cement used.	5,966 53	
Pipe used	14,634 09	
Sand used	116 00	
Catch-basins built ..	2,218 65	
Blasting powder. ...	47 65	
Am't carried forward.	\$91,262 36	\$84,374 31

BOOK-KEEPER'S REPORT.

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Am't brought forward ..	\$91,262 36	\$84,374 31
For Oil	1 60	
Plumbing	17 50	
Labor	1,440 82	
Stone	8 00	
Filling	1,893 60	
Oakum	1 20	
Advertising	172 88	
Repairing derricks..	24 96	
Plumbing, where wa- ter service pipes had to be cut and reconnected	328 75	
		\$95,151 67
<i>On acc't Miscellaneous Items:</i>		
Paid Sewerage Loan Bonds due July 1st, 1880 ..		490,000 00
Paid Corn Exch'ge Nat'l Bank, for interest...		404 46
For lithographing and printing new Sewer- age bonds		400 00
Iron covers		3,132 51
Pipe on hand	7,880 59	
Pipe used in repair- ing sewers	4,991 75	
Pipe used for house drains, in excess of balance on hand January, 1880...	46 12	
		12,918 46
Cement used on Mad- ison street bridge abutments	308 75	
Cement used for re- pairing sewers...	2,101 36	
Am't carried forward.	\$2,410 11	\$686,381 41

Am't brought forward..	\$2,410 11	\$686,381 41
For Cement used in 1879		
and charged in		
1880.....	1,113 80	
		3,523 91
For Brick on hand.....		24,495 33
Covers used in 1879		
and charged in		
1880, for repairs		
and intersections.	1,226 00	
Covers used in 1880		
for repairs and in-		
tersections.....	3,061 35	
Overcharge for covers	8 75	
Covers on hand.....	1,030 86	
		5,326 96
		\$719,727 61
Receipts over Expenditures.....		
		\$30,554 25

APPROPRIATION FUND.

RECEIPTS.

On acc't Streets North Division:

Amount appropriated by		
City Council.....	40,000 00	
Amount rec'd for paving,	293 50	
		\$40,293 50

On acc't Streets South Division:

Amount appropriated by		
City Council.....	60,000 00	
Am't rec'd for paving,&c.	1,360 04	
Am't rec'd from McMul-		
len & Officer, contrib-		
uted toward planking		
Main street	500 00	
Am't carried forward.	\$61,860 04	\$40,293 50

Am't brought forward..	\$61,860 04	\$40,293 50
Amount received from		
Sewerage Fund, for		
repairing outlets of		
Madison street sewer,	234 12	
		62,094 16

On acc't Streets West Division:

Amount appropriated by		
City Council	80,000 00	
Amount appropriated for		
steam roller	7,000 00	
Am't rec'd for paving, &c.	2,907 22	
Amount received from		
Sewerage Fund, for		
repairing outlets of W.		
Madison street sewer,	234 12	
Amount received from		
Special Ass't Fund for		
building sidewalks ..	73 78	
		90,215 12

On acc't Special Assessments:

Amount received from		
Special Ass't Fund to		
pay cost of assessm'ts,		20,797 87

On acc't City Office Expense and Salaries:

Amount appropriated by		
City Council for office		
expenses ..	1,500 00	
Amount appropriated for		
salaries	24,005 00	
Amount appropriated for		
$\frac{1}{2}$ of salary of Commis-		
sioner, Sec'y, Book-		
keeper, &c.	3,433 34	
Am't carried forward.	\$28,938 34	\$213,400 65

Am't brought forward..	\$28,938 34	\$213,400 65
Amount received from		
School Fund, for en-		
gineering.....	26 25	
		28,964 59
<i>On acc't Public Buildings:</i>		
Amount appropriated by		
City Council.....		10,300 00
<i>On acc't Sidewalks N. Division:</i>		
Amount appropriated by		
City Council.....		900 00
<i>On acc't Sidewalks S. Division:</i>		
Amount appropriated by		
City Council.....		900 00
<i>On acc't Sidewalks W. Division:</i>		
Amount appropriated by		
City Council.....		1,800 00
<i>On acc't Washington Square:</i>		
Amount appropriated by		
City Council.....		1,000 00
<i>On acc't Ellis Park:</i>		
Amount appropriated by		
City Council.....		900 00
<i>On acc't Lake Park:</i>		
Amount appropriated by		
City Council.....		3,000 00
<i>On acc't Vernon Park:</i>		
Amount appropriated by		
City Council.....		2,000 00
<i>On acc't Union Park:</i>		
Amount appropriated by		
City Council.....		3,000 00
Am't carried forward.		\$266,165 24

Am't brought forward..	\$266,165 24
<i>On acc't Jefferson Park:</i>	
Amount appropriated by City Council.....	2,000 00
<i>On acc't Wicker Park:</i>	
Amount appropriated by City Council.....	2,000 00
<i>On acc't Campbell Park:</i>	
Amount appropriated by City Council.....	200 00
<i>On acc't Congress Park:</i>	
Amount appropriated by City Council.....	200 00
<i>On acc't Aldine Square:</i>	
Amount appropriated by City Council.....	200 00
<i>On acc't Oak Park:</i>	
Amount appropriated by City Council.....	150 00
<i>On acc't Green Bay Park:</i>	
Amount appropriated by City Council.....	150 00
<i>On acc't Washington St. Tunnel:</i>	
Amount appropriated by City Council.....	2,000 00
<i>On acc't La Salle Street Tunnel:</i>	
Amount appropriated by City Council.....	2,300 00
<i>On acc't Public Benefits:</i>	
Amount appropriated by City Council.....	\$165,869 77
Amount received from Special Assessment Fund.....	4,000 00
	169,869 77
Am't carried forward.	\$445,235 01

Am't brought forward..	\$445,235 01
<i>On acc't Chicago Harbor:</i>	
Amount appropriated by	
City Council.....	62,400 00
<i>On acc't Bridge Tenders' Salaries:</i>	
Amount appropriated by	
City Council.....	43,118 00
<i>On acc't Bridge and Viaduct Re-</i>	
<i>pairs:</i>	
Amount appropriated by	
City Council.....	\$40,324 00
Received for rent of	
bridge protections for	
advertising purposes.	800 00
Received for damages	
done to bridges.....	259 37
Received from the N.	
Western R. R. Co.	
for repairs State St.	
Viaduct.....	400 00
Received for labor at	
Madison Street bridge	
refunded.....	15 75
Received from contin-	
gent fund for cost of	
bridge over canal at	
Ashland Ave.....	671 00
	42,470 12
<i>On acc't Kedzie Ave. Bridge:</i>	
Received from Town of	
Cicero.....	660 00
<i>On acc't Ullman St. Bridge:</i>	
Amount appropriated by	
City Council.....	500 00
Am't carried forward.	\$594,383 13

Am't brought forward.. \$594,383 13

On acc't Sangamon Street Viaduct:

Amount appropriated by

City Council.....\$46,991 00

Amount received from C.

& N. W. R. R. Co. on
account 2,195 46

Amount received from P.,

C. & St. L. R. R. Co.
on account..... 2,586 51

Amount received from C.,

M. & St. Paul R. R.
Co. on account 4,131 99

55,904 96

On acc't Harrison Street Viaduct:

Amount appropriated by

City Council..... 30,790 48

On acc't Permit Depositors:

Amount received from

sundry persons, de-
posited for replacing
pavement when taken
up 170 63

On acc't Fullerton Avenue Conduit:

Amount appropriated by

City Council..... 16,760 00

On acc't Street Signs:

Amount appropriated by

City Council 1,000 00

On acc't House Numbers:

Amount received from

certificates..... 2 50

Am't carried forward. \$699,011 70

Am't brought forward..	\$699,011 70	
<i>On acc't Street Lamps:</i>		
Amount received for dam-		
ages to lamps and		
lamp posts.....	77 25	
Amount received from		
Street Lamp Fund..	15,409 10	
		15,486 35
<i>On acc't Bridgeport Pumping Works:</i>		
Amount appropriated by		
City Council.....	100,000 00	
<i>On acc't Deficiency in Collection</i>		
<i>of Taxes:</i>		
Amount appropriated by		
City Council.....	47,768 26	
		\$862,266 31

EXPENDITURES.

<i>On acc't Cleaning and Repairing</i>		
<i>Streets in North Division:</i>		
For labor.....	\$12,859 69	
Paving blocks.....	2,112 14	
Lumber.....	1,489 56	
Sweeping improved		
streets	7,658 75	
Hardware.....	176 50	
Cinders.....	42 15	
Grading Fullerton		
avenue.....	150 00	
Advertising	19 62	
Cleaning vault.....	9 00	
Use of horse.	3 00	
Rebate for over-		
charge	12 00	
		\$24,532 41
Am't carried forward.		
		\$24,532 41

Am't brought forward . . . \$24,532 41

*On acc't Cleaning and Repairing
Streets in South Division:*

For labor	\$27,620 10	
Paving blocks	4,433 67	
Lumber	2,655 24	
Sweeping improved streets	24,745 43	
Hardware	569 62	
Cinders	218 45	
Stone	119 75	
Gravel	11 25	
Dockage of lumber	8 94	
Oil, waste and pack'g	10 28	
Coal	8 25	
Cleaning vault	27 00	
Advertising	128 99	
Tools and repairs	84 54	
		60,641 51

*On acc't Cleaning and Repairing
Streets in West Division:*

For labor	\$40,111 35	
Paving blocks	4,529 22	
Lumber	7,518 10	
Sweeping improved streets	12,208 82	
Hardware	648 39	
Stone	1,416 61	
Advertising	294 84	
Rent of yards	132 96	
Grading West Four- teenth street	80 00	
Steam roller	5,500 00	
Cinders	62 25	
Tools and repairs	78 80	
Gravel	42 00	
Am't carried forward	\$72,623 34	\$85,173 92

Am't brought forward..	\$72,623 34	\$85,173 92
For Dockage	23 61	
Painting signs for W.		
Jackson street....	2 40	
		72,649 35

On acc't Special Assessment Expense:

For collecting assessm'ts		
(County Treasurer)	\$7,867 90	
Advertising	7,072 74	
Services of Commis-		
sioners, Appraisers		
and Experts.....	3,767 42	
Fees of County Clerk	1,904 60	
Printing blanks and		
notices	249 70	
Postage stamps	150 00	
Clerk hire (extra)...	125 00	
		21,137 36

On acc't Office Expense and Salaries:

For printing, stationery &		
drawing materials.	\$791 20	
Blank books and		
binding	37 14	
Postal cards and		
stamps	164 57	
Advertising	37 32	
$\frac{1}{3}$ cost of lithograph'g		
for annual report.	64 67	
One-third cost print-		
ing annual report.	259 00	
Car fares	119 71	
Cancelling stamps..	2 59	
Cartage	2 00	
One-third cost of six		
directories	10 00	

Am't carried forward. \$1,488 20 \$178,960 63

Am't brought forward..	\$1,488 20	\$178,960 63
For Subscription to news-		
papers	27 65	
One bell and trim-		
mings.....	75	
Hardware	17 64	
Salaries Street De-		
partment	10,477 43	
Salaries Special As-		
essment Departm't	10,704 62	
Salaries Map Depart-		
ment	2,852 50	
One-third salaries of		
Commissioner, Sec-		
retary, etc.....	3,433 34	
		29,002 13

On acc't Public Buildings:

For lumber	\$315 11	
Coal	1,685 73	
Labor	5,635 82	
Hardware	117 01	
Gas	1,551 99	
Gas and steam fitting	141 84	
Paints and oil	49 25	
Furniture	206 62	
Matting and carpets.	100 17	
Doors and mouldings	57 85	
Repairing sewer....	23 00	
Ice	235 41	
Locksmithing	33 65	
Plumbing	222 92	
Tumblers, chimneys		
and other glassware	16 13	
Painting and calci-		
mining.....	375 54	
Plastering.....	80 00	
Am't carried forward..	\$10,848 04	\$207,962 76

Am't brought forward..\$10,848 04 \$207,962 76

For Brooms, dusters and

pails.....	21 48
Soap and sponges...	44 80
Wire work.....	25 86
Repairing boiler...	100 00
Water-coolers.....	24 00
Towels.....	26 32
Glass and glazing..	20 75
Advertising.....	21 60

11,132 85

On acc't Sidewalks North Division:

For salary of Inspector.. \$900 00

Repairing sidewalks. 20 83

920 83

On acc't Sidewalks South Division:

For salary of Inspector.. \$900 00

Repairing sidewalks. 133 32

1,033 32

On acc't Sidewalks West Division:

For salary of Inspectors. \$1,800 00

Repairing sidewalks. 45 82

1,845 82

On acc't Washington Square:

For Keeper's salary and

labor..... \$813 12

For lamps and lamp-posts 15 00

Hose..... 47 00

Plumbing..... 9 10

Lawn grass..... 4 29

One lawn rake..... 1 00

Sprinkling around

park..... 99 00

Cement..... 1 25

Chain..... 9 50

999 26

Am't carried forward.

\$223,894 84

Am't brought forward.. \$223,894 84

On acc't Ellis Park:

For Keeper's salary and		
labor	\$602 75	
Flower seeds	6 50	
Lawn mower and gen-		
eral hardware	23 70	
Hose and couplings.	38 00	
One lawn rake	1 00	
		671 95

On acc't Lake Park:

For Keeper's salary and		
labor	\$1,769 95	
Sprinkling	180 00	
Trees	200 00	
Printing	2 40	
Repairing fountains.	1 20	
Lawn mower and re-		
pairs	16 92	
		2,170 47

On acc't Union Park:

For Keeper's salary and		
labor	\$1,303 12	
Animals purchased.	45 25	
Feed for animals ...	189 70	
Hardware	27 82	
Paint and oil.. ...	11 14	
Coal	12 40	
Lumber	17 50	
Plumbing	65 59	
Storing plants	5 00	
Flower seed	3 50	
Canvas cover	13 00	
Lawn mower and re-		
pairs	28 24	
Painting signs	7 75	
		1,730 01

Am't carried forward. \$228,467 27

Am't brought forward.. \$228,467 27

On acc't Jefferson Park:

For Keeper's salary and		
labor.....	\$1,093 75	
Plumbing.....	57 92	
Feed for animals...	25 26	
Coal.....	6 00	
Oil and cans.....	12 90	
Lawn grass.....	6 00	
Cement.....	1 25	
Four fountain figures	24 00	
Painting fountains..	19 00	
One lawn mower...	15 00	
Repair'g water-closet	9 10	
Lamps.....	42 00	
Six wooden lamp-		
posts.....	9 00	
Two doz. park seats.	165 60	
One watering can...	1 00	
Two rakes.....	2 00	
		1,489 78

On acc't Vernon Park:

For Keeper's salary and		
labor.....	\$1,071 98	
Paint and oil.....	13 50	
Plumbing.....	8 00	
Lawn grass.....	3 00	
Repairing drains...	11 00	
Hardware.....	53 83	
Lumber.....	50 42	
Repairing lawn mow-		
ers.....	9 90	
		1,221 63

On acc't Wicker Park:

For Keeper's salary and		
labor.....	\$1,345 50	
Am't carried forward.	\$1,345 50	\$231,178 68

Am't brought forward..	\$1,345 50	\$231,178 68
For Plumbing.....	38 72	
Lumber.....	22 20	
Repairing mower...	5 00	
Hardware	37 10	
Cedar posts.....	11 70	
Cleaning vault.....	16 00	
Lawn grass.....	3 75	
Drinking fountain..	22 40	
Coal.....	4 40	
Feed for animals...	13 64	
		1,520 41

On acc't Campbell Park:

For plumbing	\$36 05	
One fountain and fence for basin...	100 00	
Repairing fence....	7 00	
Hose and sprinkler..	11 00	
		154 05

On acc't Oak Park:

For trees	\$110 00	
Plumbing	5 90	
Labor.....	15 37	
Lawn grass.....	7 96	
		139 23

On acc't Green Bay Park:

For trees	\$110 00	
Hose	22 27	
Labor.....	28 50	
		160 77

On acc't Washington St. Tunnel:

For Salary of Engineer and labor.....	\$982 12	
Coal	62 45	
Hardware.....	3 25	
Am't carried forward.	\$1,047 82	\$233,153 14

Am't brought forward..\$35,030 01 \$451,324 70

For Lamps, lanterns and	
oil	837 69
Clocks.....	18 00
Rebate on damages	
receiv'd from barge	
"Alcona"	20 69
New turn table for	
State street bridge.	2,291 37
Repairs on State st.	
bridge	1,652 33
Iron work.....	2,555 73
Experts examining	
State street bridge	70 00
Gas fitting.....	97 64
Damages to vessels..	478 13
Rope and chain....	157 11
Repairing roof of	
bridge houses....	69 00
Raising and paving	
Adams st. viaduct.	401 25
Ground rent for b'dge	
houses and dockage	236 25
Use of tug.....	65 20
Wheel-blocks	53 75
Painting iron work.	50 00
Stone	13 13
Grading towpath at	
Kedzie ave. bridge	25 00
Piles, pile driving and	
repairs of dock...	2,303 86
Constable fees.....	10 00
Plastering bridge	
house	28 00
Iron	553 26

Am't carried forward.\$47,017 40 \$451,324 70

Am't brought forward..\$47,017 40 \$451,324 70

For Nails,spikes and gen-

eral hardware..... 1,007 77

Painting signs..... 21 25

Tools and repairs... 217 99

Bolts, anchors and
washers 227 01

Castings 697 40

Plumbing 13 62

Brooms 24 55

Teaming 6 00

Paint, lead, oil and
turpentine 158 99

Canal bridge at Ash-
land avenue... .. 671 00

Glass and putty ... 8 23

Stoves, pipes and re-
pairs..... 58 00

Repairing abutments
to Madison street
bridge:

Labor....\$8,424 92

Lumber... 204 65

Nails 115 90

Iron 118 62

Rope 51 17

Stone 1,392 40

Cement... 952 25

Gas 153 46

Use of scow 24 00

Use of der-
rick 168 12

Advertising 67 01

Am't carried

forward..\$11,672 50 \$50,129 21 \$451,324 70

Am't brought		
forward..	\$11,672 50	\$50,129 21 \$451,324 70
For Hammers,		
p u m p ,		
lamps and		
oil	25 63	
Pipe fitting	20 51	
		11,718 64
		61,847 85
<i>On acc't Kedzie Avenue Bridge:</i>		
For constructing bridge		
(final estimate)...		2,156 50
<i>On acc't Ullman Street Bridge:</i>		
For advertising.		49 50
<i>On Stock Account:</i>		
For tools and repairing.		126 50
<i>On acc't Sangamon Street Viaduct:</i>		
For masonry, paid con-		
tractor	\$10,332 60	
Engineering, inspect-		
ing and labor . . .	995 99	
Advertising.	101 95	
Plumbing	34 14	
		11,464 68
<i>On acc't Harrison Street Viaduct:</i>		
For engineering, inspect-		
ing and labor . . .	548 03	
Earth filling.	271 35	
Advertising.	98 35	
Printing and draw-		
ing plans.	27 15	
Felting for sidewalk	19 08	
		963 96
<i>On acc't Fire Department:</i>		
For preparing plans of		
engine houses. . . .		253 50
Am't carried forward.		\$528,187 19

Am't brought forward.. \$528,187 19

On acc't Fullerton Avenue Conduit:

For engines on account.	\$2,000 00
Engine house in full	1,000 00
Coal.....	3,200 89
Labor.....	4,095 80
Oil and alcohol....	546 00
Lumber.....	409 67
Building coal shed..	104 99
Hardware.....	45 63
Waste and packing.	120 93
Steam fitting	187 16
Advertising	19 30
1 scale	52 50
Iron work.....	12 96
Construc'g telephone line	288 38
Oil tanks	10 75
Chimneys.....	11 70
Castings.....	18 43
Setting gate.....	35 00
Clock.....	6 00
Brooms	3 00
Pig lead	11 00
Taps and plugs.....	90
Soap.....	3 15
Drawings.....	8 00
Laying pipe.....	87 91
Repairing roof.....	12 75
Repairing tools	8 61
Hose.....	7 49
Use of tug and scow.	160 50
Wire.....	5 00
Screws for engine ..	250 00
Rope.....	18 62
1 record book.....	9 00

Am't carried forward.\$12,752 02 \$528,187 19

Am't brought forward..	\$12,752 02	\$528,187 19
For Testing engines (p'd		
N. Pumping Wks).	14 74	
		12,766 76

On acc't Street Signs:

For lettering signs.....		150 65
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On acc't Street Lamps:

For labor.....	\$3,828 75	
Glass	2,779 30	
Lamp posts	1,011 15	
Lamp sockets.....	540 64	
Tin.....	441 64	
Solder.....	182 76	
Tips.....	106 46	
Castings.....	697 47	
Tools.....	136 92	
Hardware	73 24	
Coke	18 50	
Gas governor	70 00	
Paint and oil	340 32	
Iron pins	107 21	
Shellac and alcohol.	94 12	
Acid	11 00	
Burners	10 50	
Lead	12 75	
Charcoal	79 50	
Removing posts	28 00	
Advertising	55 24	
Horse keeping and		
stabling	188 75	
Horseshoeing	30 88	
Repairing wagon....	57 70	
Teaming.....	12 00	
Brass pillars and		
butts	24 12	

Am't carried forward..	\$10,938 92	\$541,104 60
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Am't brought forward..	\$10,938 92	\$541,104 60
Rivets.....	3 45	
Lettering signs.....	14 82	
Gas fitting.....	92 00	
Rent of workshop..	110 00	
Painting lamp posts.	98 30	
		\$11,257 49
<i>On acc't Bridgeport Pumping Works:</i>		
For Engineering and		
labor.....	65 00	
Advertising.....	113 25	
Printing blanks (pro-		
posals for ma-		
chinery).....	15 50	
		\$193 75
		\$552,555 84
Receipts over expenditures.....		
		\$309,710 47

CITY HALL FUND.

RECEIPTS.

Amount appropriated by	
City Council.....	
	\$220,000 00

EXPENDITURES.

Paid Johnson & Co., on	
acc't of contract for	
fire-proofing.....	\$2,720 00
Paid P. J. Sexton, on acc't	
contract for iron work	
on City Hall.....	34,255 00
Paid P. J. Sexton, on acc't	
contract for iron work	
on Rotunda.....	2,975 00
Am't carried forward.	\$39,950 00

Am't brought forward..	\$39,950 00
Paid John Angus, on acc't contract for brick work on City Hall..	47,057 94
Paid Thomlinson & Reed, on acc't contract for cut stone work on City Hall.....	203,722 53
Paid Thomlinson & Reed, in full of contract for granite columns....	37,000 00
Paid Wm. McNeill & Son, on acc't contract for cut stone work on Ro- tunda.....	8,711 25

Miscellaneous Expenditures:

Paid for services of in- spectors, draughtsmen and laborers	\$4,623 00	
For iron and iron work..	1,421 65	
Lead	10 12	
Advertising	105 73	
Painting iron work..	1,305 50	
Plumbing	62 63	
Printing and station- ery	118 51	
Hardware	1 35	
Drain pipe	72 00	
Laying water pipe..	309 31	
Use of steam derrick and labor	140 60	
Hauling manure....	216 00	
		\$8,386 40
		\$344,828 12
Expenditures over receipts.....		
		\$124,828 12

RECAPITULATION.

RECEIPTS.

Water Fund.....	\$920,785 16
Sewerage Fund.....	102,515 95
Sewerage Tax Fund....	750,281 86
Appropriation Fund ...	862,266 31
City Hall Fund.....	220,000 00
	\$2,855,849 28

EXPENDITURES.

Water Fund.....	\$1,050,958 01
Sewerage Fund	89,607 97
Sewerage Tax Fund....	719,727 61
Appropriation Fund	552,555 84
City Hall Fund.....	344,828 12
	\$2,757,677 55

Receipts over expenditures..... \$98,171 73

Respectfully submitted,

F. C. MEYER, *Accountant.*

CITY ENGINEER'S REPORT

DEPARTMENT PUBLIC WORKS,

CHICAGO, February 22, 1881.

CHARLES S. WALLER, ESQ.,

Commissioner.

SIR: I present herewith the Fifth Annual Report of the "Engineer Department," being for the year ending December 31st, 1880, commencing with the

WATER SUPPLY.

The total net quantity of water delivered to the city during the past year was 21,002,681,905 gallons, being a fraction over two per cent. in excess of the quantity delivered during 1879.

The daily average delivered during the past year was 57,384,376 gallons, or a little over one million gallons more than during 1879.

The greatest daily average for a single month during the past year was in July, viz.: about 61 $\frac{7}{8}$ million gallons.

The least daily average for a single month was in January, the quantity being about 50 $\frac{1}{2}$ million gallons.

The largest quantity supplied in a single day was on December 31st, viz.: nearly 73 million gallons.

The smallest for a like period was on January 18th, being about 45 $\frac{7}{8}$ million gallons.

The annexed tabulated statements exhibit in detail the operations of the machinery of both pumping works during the year 1880 :

OPERATIONS OF BOTH PUMPING WORKS COMBINED.

MONTHS. 1880.	No. of days.	No. of hours run per month. H. M.	Average No. of hours run per day. H. M.	Total revolutions per month.	Average No. of revolu- tions per day.	Total No. of gal- lons of water pumped per month, less 5% per cent. for loss of action.	Av. No. of gal. of water pumped per day, less 5% per cent. for loss of action.	Pounds of coal consum- ed per month for pumping.	Av. No. of lbs. of coal con- sum'd per day for pump'g.	Lbs. of coal con- sum'd per Mo. for changing boilers.	Total pounds of coal consumed per month.	Average head against pumps in feet.	DUTY.
January	31	744:00	24:00	1,322,851	42,672	1,567,144,633	50,553,052	2,560,440	82,595	9,100	2,569,540	94.5	49,277,212
February	29	696:00	24:00	1,117,537	38,534	1,533,195,592	52,868,813	2,301,270	79,354	9,900	2,311,170	105.6	60,247,712
March	31	744:00	24:00	1,236,236	39,878	1,675,170,272	54,037,750	2,471,280	79,719	12,300	2,483,580	104.73	60,660,452
April	30	720:00	24:00	1,219,182	40,639	1,658,718,639	55,290,621	2,548,140	84,938	12,100	2,560,240	105.8	58,151,982
May	31	744:00	24:00	1,311,224	42,297	1,781,045,267	57,453,073	2,872,520	92,662	12,800	2,885,320	105.2	54,455,857
June	30	720:00	24:00	1,347,429	44,914	1,813,621,318	60,454,043	2,956,960	98,565	8,800	2,965,760	104.3	53,493,694
July	31	744:00	24:00	1,553,284	50,106	1,917,520,346	61,855,495	3,050,036	98,388	20,700	3,070,736	102.6	54,446,374
August	31	744:00	24:00	1,748,775	56,412	1,898,248,864	61,233,834	2,884,820	93,059	9,600	2,894,420	100.0	56,717,603
September	30	720:00	24:00	1,434,182	47,806	1,798,031,710	59,934,390	2,796,970	93,232	10,200	2,807,170	101.2	55,183,550
October	31	744:00	24:00	1,338,434	43,175	1,772,878,722	57,189,636	2,684,940	86,611	14,700	2,699,640	98.4	55,807,820
November	30	720:00	24:00	1,271,326	42,377	1,705,207,141	56,840,238	2,572,230	85,741	11,500	2,583,730	97.8	55,367,065
December	31	744:00	24:00	1,434,967	46,290	1,881,899,401	60,706,432	2,883,810	93,026	10,400	2,894,210	98.0	54,894,515
Totals	366	8,784:00	.....	16,335,417	.....	21,002,681,905	.....	32,583,416	.....	142,100	32,725,516	101.5	55,882,589
Gen'l av. per month.	.....	732:00	.....	1,361,285	.....	1,750,223,492	.....	2,715,285	.....	11,842	2,727,126	.....	.....
Gen'l av. per day	.....	24:00	.....	.....	44,632	.....	57,384,376	.....	89,025	388	89,414	.....	.....

ENGINEER'S REPORT.

TABLE SHOWING TOTAL QUANTITY OF WATER PUMPED BY BOTH PUMPING WORKS COMBINED;
TOGETHER WITH ANNUAL AND DAILY INCREASE IN QUANTITY AND RATE PER CENT.; ALSO, THE GREATEST DAILY AVERAGE
FOR A SINGLE MONTH, FOR THE FOLLOWING YEARS:

YEAR.	TOTAL QUANTITY PUMPED. GALLONS.	ANNUAL INCREASE, GALLONS.	AVERAGE DAILY QUANTITY PUMPED. GALLONS.	AVERAGE DAILY INCREASE, GALLONS.	PER CENT OF ANNUAL INCREASE.	GREATEST DAILY AVERAGE.	
						MONTH.	GALLONS.
1876	16,346,922,158	.....	41,931,481	.....	....	December.....	47,063,724
1877	19,047,104,636	3,700,182,478	52,183,892	10,252,411	24.45	July.....	56,912,360
1878	19,564,288,232	617,183,596	63,600,789	1,416,897	2.71	August.....	61,620,762
1879	20,557,690,981	993,402,749	66,322,441	2,721,652	5.07	January.....	64,022,571
1880	21,002,681,905	444,990,924	67,384,376	1,061,935	2.16	July.....	61,865,495

The pumping and cost of same for the past two years, were as follows:

YEAR.	PUMPING.		COST.	
	TOTAL NO. OF GALLONS.	DAILY AVERAGE.	TOTAL COST.	AVERAGE PER MIL- LION GALLONS.
1879	20,557,690,981	56,322,431	\$110,334.18	\$5.36 ⁷⁰ / ₁₀₀
1880	21,002,681,905	57,384,376	114,704.12	5.46 ¹² / ₁₀₀
Increase.	444,990,924	1,061,935	\$4,369.94	\$0.09 ⁴³ / ₁₀₀

The annexed diagram illustrates the daily quantity of water pumped by the North and West Works, respectively, and both combined.

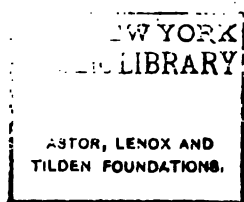
THE TWENTY-EIGHTH ANNUAL REPORT OF THE NORTH PUMPING WORKS

is as follows: The total net quantity of water pumped by these Works during the year was 12,354,008,905 gallons, being nearly ten per cent. in excess of the quantity pumped during the year 1879.

The daily average pumped during the year was a trifle over 33 $\frac{3}{4}$ million gallons, or nearly 3 $\frac{1}{4}$ millions more than in 1879. The greatest daily average pumped for a single month was in June, viz: 36 $\frac{1}{4}$ million gallons.

The least daily average was in February, viz: 31 $\frac{1}{4}$ million gallons.

The following tabulated record exhibits in detail the operations of pumping machinery for the year 1880:



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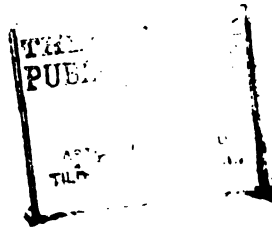
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OPERATIONS OF ENGINES AND BOILERS AT THE NORTH PUMPING WORKS.

MONTH. 1880.	No. of Days	No. of Hours run per Month. H. M.	Average No. of Hours run per Day. H. M.	Total Revolutions per Month.	Average No. of Revolutions per Day	Total No. of Gals. of Water pumped per Month, less 5% per cent. for loss of action.	Average No. of Gals. of Water pumped per day, less 5% per cent. for loss of action.	Pounds of Coal consumed per Month for Pumping.	Average No. of Pounds of Coal consumed per day for Pumping.	Pounds of Coal con- sumed per Month for changing boilers.	Total pounds of Coal consumed per Month.	Average Head against Pumps in feet.	DUTY.
January.....	31	744:00	24:00	743,126	23,972	987,419,633	31,852,246	1,712,640	55,246	4,900	1,717,540	94.3	45,343,266
February.....	29	696:00	24:00	490,995	16,931	906,653,692	31,263,917	1,462,270	50,423	4,900	1,467,170	109.3	56,512,247
March.....	31	744:00	24:00	539,956	17,418	978,890,272	31,577,105	1,553,080	50,100	5,300	1,558,380	108.7	57,139,413
April.....	30	720:00	24:00	535,269	17,842	974,805,639	32,493,521	1,558,840	51,961	5,400	1,564,240	110.1	57,420,882
May.....	31	744:00	24:00	590,622	19,052	1,060,443,267	34,207,847	1,685,320	54,365	8,200	1,693,520	109.8	57,619,625
June.....	30	720:00	24:00	620,257	20,675	1,086,449,318	36,214,977	1,764,960	58,832	5,500	1,770,460	109.1	56,009,998
July.....	31	743:15	23:58	758,320	24,462	1,122,556,346	36,211,495	1,863,930	60,127	5,500	1,869,430	107.3	53,735,922
August.....	31	744:00	24:00	920,300	29,687	1,069,773,864	34,508,834	1,816,820	58,607	5,600	1,822,420	104.3	51,218,914
September.....	30	720:00	24:00	716,833	23,894	1,080,682,710	36,022,757	1,863,970	62,132	5,600	1,869,570	105.0	50,725,804
October.....	31	744:00	24:00	603,968	19,482	1,038,422,722	33,497,507	1,703,940	54,966	8,700	1,712,640	98.3	49,961,958
November.....	30	720:00	24:00	548,448	18,281	982,329,141	32,744,305	1,594,030	53,134	6,000	1,600,030	99.5	51,138,691
December.....	31	744:00	24:00	618,650	19,956	1,065,582,401	34,373,626	1,790,610	57,761	6,000	1,796,610	100.5	49,879,044
TOTALS.....	366	8,783:15	.....	7,686,744	.....	12,354,008,905	.....	20,370,410	.....	71,600	20,442,010	104.7	52,956,664
General Average per Month.....	.....	731:56	.....	640,562	.....	1,029,500,742	.....	1,697,534	.....	5,967	1,703,501	.....	.....
General Average per Day.....	.....	23:59	.....	21,002	.....	33,764,122	.....	55,657	.....	195	55,852	.....	.....

NOTE.—Coal for heating building and pumping out wells included in above amounts.

The annexed table sets forth the total quantity of water pumped, and the time run by the several engines respectively:

ENGINES DESIGNATED AS	HOURS AND MINUTES.		TOTAL REVOLUTIONS.	Total gallons of water pumped, less 5% per cent. for loss of action.
	H.	M.		
1853	633	58	380,267	186,103,179
1857	1,801	04	1,155,249	889,264,474
1867	2,989	12	1,953,406	1,856,109,520
1872	8,059	47	4,197,822	9,422,531,732
Totals	13,484	01	7,686,744	12,354,008,905

The south or "72" engines have pumped over three-fourths of all the water delivered from these works, and over two-fifths of the entire quantity used by the City.

FUEL.

Coal as been received and used as follows :

LACKAWANNA COAL.			
		Tons.	Pounds
On hand January 1st, 1880.....		507	1720
Received		10,604	1060
		Tons.	Pounds.
Used for pumping, heating build- ing, etc.....	10,187	1210	
Used for workshop.....	37	1980	
On hand Jan. 1, 1881.....	886	1590	
Total.....	11,112	780	11,112 780
LAUREL HILL COAL.			
On hand Jan. 1st, 1880.....		6	1310
Received.....		203	1130
Used for changing boilers.....	35	1600	
Used for workshop, pipe extension, etc.....	168	1210	
Used for pumping lake tunnel.....	3	1800	
On hand Jan. 1st, 1881	1	1830	
Total.....	210	440	210 440

Cost of delivering water per million gallons.....	\$5 67 $\frac{82}{100}$
Cost of delivering water per million gallons one foot high.....	05 $\frac{42}{100}$
Cost of repairs per million gallons.....	09 $\frac{78}{100}$
Distributed as follows:	
To engines.....	05 $\frac{77}{100}$
To boilers.....	04 $\frac{1}{100}$

The following is the cost of delivering water per million gallons during the past ten years, and cost of coal:

	AVERAGE COST OF COAL PER TON.	COST PER MILLION GALS.
1872.....	\$8 09	\$12 02
1873.....	7 18	11 64
1874.....	8 56	12 86
1874-5.....	8 27	12 26
1875 (9 months only).....	7 93	10 81
1876.....	7 15	9 56
1877.....	5 38	7 09
1878 (estimated, screenings used).....	4 39	6 24
1879.....	4 14	5 65
1880.....	4 83	5 68
	\$6 59	\$9 38

The quantity pumped each month for the past ten years is as follows:

TABLE SHOWING QUANTITY OF WATER PUMPED AT THE "NORTH PUMPING WORKS" EACH MONTH DURING
PAST TEN YEARS.

MONTH.	1871-72.	1872-73.	1873-74.	1874-75.	1875.	MONTH.	1876.	1877.	1878.	1879.	1880.
April	720,000,000	696,411,330	916,329,315	969,285,640	1,243,837,877	January ...	1,208,605,503	719,462,385	898,314,068	1,138,741,094	987,419,633
May	713,000,000	738,520,288	951,025,086	1,044,115,222	1,256,605,033	February ..	1,169,388,869	774,594,448	815,598,987	983,647,026	906,623,592
June	735,000,000	748,938,470	936,614,148	1,010,032,523	1,163,985,505	March	1,244,271,298	1,088,521,789	996,047,019	1,083,277,148	978,890,272
July	806,000,000	876,206,981	1,000,695,844	1,297,543,064	1,239,434,124	April	1,190,825,503	1,109,008,815	586,000,942	677,241,146	974,805,639
August	868,000,000	852,976,814	1,033,164,846	1,322,546,047	1,273,876,926	May	1,300,577,131	1,154,372,813	639,630,004	781,082,231	1,000,443,267
September	780,000,000	842,668,858	973,690,925	1,246,442,604	1,190,570,888	June	1,287,317,437	1,110,876,865	734,020,984	755,459,026	1,086,446,318
October	442,337,931	843,791,299	1,018,933,312	1,151,106,735	1,227,568,188	July	1,358,762,909	1,115,239,814	1,114,216,563	1,046,815,119	1,122,556,346
November	657,138,219	833,879,447	1,023,633,854	1,036,221,656	1,160,694,177	August	1,376,669,544	1,066,176,419	1,122,492,614	1,009,989,439	1,009,773,864
December	620,509,358	877,853,961	1,026,290,368	1,140,266,745	1,192,680,258	September ..	1,243,745,860	1,012,638,066	1,050,881,650	989,337,876	1,080,682,710
January	684,569,031	905,391,154	955,646,383	1,193,462,490	1,193,462,490*	October	1,268,071,044	998,713,776	1,064,388,733	1,047,194,358	1,038,452,722
February	668,788,030	893,244,790	884,813,362	1,136,965,231	1,136,965,231*	November ..	1,015,851,277	909,774,581	1,145,355,798	786,233,037	982,329,141
March	728,439,377	976,055,777	1,002,041,559	1,355,299,536	1,355,299,536*	December ..	869,709,283	800,607,884	1,078,271,910	794,884,281	1,005,582,401
Totals	8,423,890,966	10,050,939,189	11,722,819,932	13,903,197,493	14,643,990,233	Totals	14,525,858,798	11,958,977,646	11,145,370,232	11,153,102,081	12,354,008,906

* These three months' figures were borrowed from the previous year (the commencement of the municipal year having been changed), in order to make up twelve months' work. They exceed the actual quantity pumped by 69,338,337 gallons, but it being leap year, there were twenty-nine days in February, besides which the new pumping works were in operation.

TABLE SHOWING TOTAL QUANTITY OF WATER PUMPED AT THE NORTH PUMPING WORKS,
TOGETHER WITH ANNUAL AND DAILY INCREASE IN QUANTITY,
AND RATE PER CENT.

ALSO THE GREATEST DAILY AVERAGE FOR A SINGLE MONTH, FOR THE FOLLOWING YEARS.

Year Ending	Total Quantity Pumped. GALLONS.	Annual Increase. GALLONS.	Average Daily Quantity Pumped. GALLONS.	Average Daily Increase. GALLONS.	Per Cent. of Annual Increase.	GREATEST DAILY AVERAGE.	
						MONTH.	GALLONS.
December 31, 1858.	1,091,865,439	.....	2,991,413	.....	.....	September.	3,617,818
" 31, 1859.	1,416,147,910	323,282,453	3,877,119	855,706	29.61	October.	4,565,388
" 31, 1860.	1,716,786,552	301,338,642	4,703,525	826,406	21.31	July.	5,367,569
" 31, 1861.	1,767,154,689	50,368,137	4,841,520	137,993	2.93	August.	5,438,790
" 31, 1862.	2,217,279,739	450,125,050	6,074,739	1,233,219	25.47	July.	6,748,899
" 31, 1863.	2,336,108,454	118,128,715	6,400,298	325,559	5.35	January.	6,770,483
" 31, 1864.	2,523,339,218	187,230,764	6,913,359	512,961	8.01	August.	8,293,850
" 31, 1865.	2,777,817,349	254,478,131	7,610,459	697,200	10.08	September.	8,871,530
" 31, 1866.	3,168,769,609	390,943,260	8,681,536	1,071,077	14.07	July.	10,022,164
" 31, 1867.	4,231,791,659	1,063,031,050	11,562,273	2,800,737	33.18	March.	12,455,113
" 31, 1868.	5,374,624,576	1,142,832,917	14,724,999	3,162,726	27.35	March.	16,414,460
" 31, 1869.	6,801,146,720	1,426,522,144	18,633,278	3,908,279	26.54	July.	20,689,014
" 31, 1870.	7,944,684,840	1,143,538,120	21,766,260	3,133,082	16.81	August.	25,712,589
" 31, 1871.	8,423,890,966	479,206,486	23,464,877	1,698,617	7.80	August.	28,000,000
" 31, 1872.	10,050,939,189	1,627,048,223	27,536,819	4,071,942	17.35	March.	31,485,670
" 31, 1873.	11,722,819,032	1,671,879,843	32,117,312	4,580,493	16.63	November.	34,121,128
" 31, 1874.	13,903,197,493	2,180,378,461	38,090,952	5,973,640	18.60	March.	43,717,404
" 31, 1875.	10,957,252,996	† 739,722,760	39,844,556	1,763,604	4.60	April.	41,461,262
" 31, 1876.	14,520,858,798	.....	39,688,138	.....	.....	August.	44,408,695
" 31, 1877.	11,958,977,646	.....	32,764,323	.....	.....	* May.	37,237,833
" 31, 1878.	11,145,370,232	.....	30,535,261	.....	.....	November.	38,178,526
" 31, 1879.	11,153,102,981	.....	30,556,446	.....	.....	January.	36,733,603
" 31, 1880.	12,354,008,903	.....	33,754,122	.....	.....	June.	36,214,977

† Compared with the same months of the year before.

* Exclusive of quantity pumped by "West Works."

THE OPERATIONS

of these works have been uninterrupted during the year, no accident or stoppage of any kind having occurred.

During the month of February last, the ice around the Crib proved very troublesome, but the force stationed at that point managed to keep the openings free.

No trouble was experienced until the latter part of the year, which will be referred to hereafter.

THE ENGINES

are all in good order, although by long continued use the two old single engines require more repairs than the double engines. The work done in this regard during the past year has been merely of an ordinary character.

The same may be said of boilers; one of which, as heretofore reported, will soon need a complete rebuilding.

THE BUILDINGS

are all in good condition, with the exception of main roof, which has been referred to so often. Plans and specifications are being prepared for a new roof, which should be put in place the coming season.

The long deferred coal houses should also be built without delay, so that

THE GROUNDS

east of the main building can be put in condition to correspond with balance of premises.

The space west of main building is in excellent order. A few of the dead trees have been replaced.

THE SHORE INLET

has been kept in good condition by pumping out the conduit, removing all sand and dirt, and repairing the gates. The preservation of this inlet is essential in case of a stoppage of water at the Crib. A wooden conduit has been put in to carry the hot

waste water from the air-pumps to the shore, for the purpose of keeping the ice from accumulating at mouth of inlet. A number of piles have been put in at foot of Pierson street, to protect the washing away of street by the waves of the lake. These piles were sunk by the force of water from an adjacent fire-hydrant.

A new telegraph cable has been put in under ground, connecting the cable in the water tunnel to the instruments in the pumping works.

No change has been made in the force at these works. Assistant engineers Trautmann, Horner and Belton, and others employed, have faithfully discharged their respective duties.

WEST PUMPING WORKS.

The engineer in charge of these works presents the following statement of their operations:

WEST PUMPING WORKS,

CHICAGO, Feb. 15th, 1881.

D. C. CREGIER, Esq.,

Acting City Engineer.

SIR: The fifth annual report of the operations of these works being for the year ending December 31st, 1880, is herewith submitted.

ENGINES.

Both engines have been in constant operation during the entire year, excepting nine days in the month of January on each; one being stopped for repairs while the other was running.

Each engine has worked in a very satisfactory manner. The head of water has been about two feet less than during the preceding year, and was quite uniform. The decrease of head each year shows the increase in demand for water, and the consequent necessity for more machinery.

BOILERS.

The boilers are in good condition; the repairs required during the year being very slight. The working was very satisfactory.

BUILDING.

Everything about the building is in good shape, with the exception of the floor in the basement between the engines. This floor is at present nothing but the rough timbers that were placed there during the erection of the engines, and to which attention has been called in all previous reports. The roof over fire-room, to which I called attention last year, has been repaired. Three ventilators have been put in, which have proved very beneficial.

FORCE.

The working force remains the same as last year. Engineers Stewart, Hill and Commons have individually performed their duties in a faithful manner.

Respectfully submitted,

HENRY MASON, *Engineer.*

OPERATIONS OF ENGINES AND BOILERS AT THE WEST PUMPING WORKS.

MONTHS. 1880.	No. of Days	No. of hours run per Month. H. M.	Average No. of hours run per Day. H. M.	Total revolutions per Month.	Av. No. of revolutions per Day.	Total No. of gal- lons of water pumped, per cent. for loss of action.	Average No. of gallons of water pumped per Day less per cent. for loss of action.	Pounds of coal consumed per Month for pumping.	Average No. of lbs. of coal consumed per Day for pumping.	Lbs. of coal con- sumed per Day, for boilers, etc.	Total lbs. of coal consumed Month.	Average Head of water in feet.	DUTY.
January.....	31	744:00	24:00	679,725	18,700	679,725,000	18,700,806	847,800	27,348	4,200	852,000	94.69	53,211,158
February.....	29	696:00	24:00	626,542	21,604	626,542,000	21,604,897	839,000	28,931	5,000	844,000	102.—	63,983,176
March.....	31	744:00	24:00	696,280	22,460	696,280,000	22,460,645	918,200	29,620	7,000	925,200	100.75	64,181,490
April.....	30	720:00	24:00	683,913	22,797	683,913,000	22,797,100	989,300	32,977	6,700	996,000	101.4	58,883,082
May.....	31	744:00	24:00	720,602	23,245	720,602,000	23,245,226	1,187,200	38,297	4,600	1,191,800	100.6	51,292,088
June.....	30	720:00	24:00	727,172	24,239	727,172,000	24,239,067	1,192,000	39,733	3,300	1,195,300	99.5	50,977,389
July.....	31	744:00	24:00	794,964	25,644	794,964,000	25,644,000	1,186,106	38,261	15,200	1,201,306	98.—	55,156,826
August.....	31	744:00	24:00	828,475	26,725	828,475,000	26,725,000	1,068,000	34,451	4,000	1,072,000	95.5	62,216,292
September.....	30	720:00	24:00	711,349	23,911	711,349,000	23,911,633	933,000	31,100	4,600	937,600	97.4	59,641,297
October.....	31	744:00	24:00	734,456	23,692	734,456,000	23,692,130	981,000	31,645	6,000	987,000	98.5	61,653,682
November.....	30	720:00	24:00	722,878	24,096	722,878,000	24,096,926	978,200	32,607	5,500	983,700	96.—	59,695,439
December.....	31	744:00	24:00	816,317	26,332	816,317,000	26,332,806	1,093,200	35,264	4,400	1,097,600	95.5	59,909,985
Totals	366	8,784:00	.....	8,648,673	.....	8,648,673,000	.....	12,213,006	.....	70,500	12,283,506	98.32	58,808,495
Gen'l av. per month .....	.....	732:00	.....	720,723	.....	720,722,750	.....	1,017,750	.....	5,857	1,023,625	.....	.....
Gen'l av. per day .....	.....	24:00	.....	.....	23,633	.....	23,630,254	.....	33,369	192	33,661	.....	.....

NOTE.—Coal for heating building and pumping out wells included in above amounts.

The annexed table sets forth the total quantity of water pumped, and the time run by the two engines respectively.

ENGINES DESIGNATED AS.	HOURS AND MINUTES. H. M.	TOTAL REVOLUTIONS	Total gallons of water pumped, less 5% per cent. for loss of action.
No. 25.....	7,440:30	4,330,833	4,330,833,000
No. 26	7,433:25	4,317,840	4,317,840,000
Totals.....	14,873:55	8,648,673	8,648,673,000

The West Works pumped over two million gallons per day, or about eight per cent. less in the aggregate than last year.

FUEL.

Coal has been received and used as follows:

LACKAWANNA COAL.			
	TONS.	POUNDS.	
On hand January 1st, 1880.....	121	1,395	
To balance account.....	185	400	
Received	1,723	1,525	
Used for pumping, heating, build- ing, etc.....	1,521	1,861	
Sent to North Pumping Works..	508	1,459	
Total.....	2,030	1,320	2,030 1,320

SOFT COAL.			
Received of Pittsburgh Nut.....	2,188	1,395	
Received of Laurel Hill Lump.....	416	1,430	
Received of Streator Nut.....	1,012	100	
Received of Streator Lump	658	1,960	
Received of Wilmington	21	250	
Received of Briar Hill	75	600	
Received of Piedmont	87	1,490	
Received of Erie Lump	213	600	
Received of Erie Nut	47	1,630	
Am't carried forward	4,721	1,455	

	TONS.	POUNDS.
Am't brought forward.....	4,721	1,455
Used for pumping, heating build- ing, etc.....	4,584	1,145
Used for changing boilers, etc.....	36	600
Used for pipe yard.....		1,750
On hand Jan. 1st, 1881.....	99	1,960
Total.....	4,721	1,455 4,721 1,455

The following statement and tables are added, in connection with the operation of the West pumping works:

Cost of delivering water per million gallons.....	\$5.15 $\frac{7}{100}$
Cost of delivering water per million gallons, one foot high.....	.05 $\frac{24}{100}$

The following is the cost of delivering water per million gallons during the past four years, and cost of coal at the West works:

	AVERAGE COST OF COAL PER TON.	COST PER MILLION GALLONS.
1877.....	\$5 22	\$6 66
1878, (estimated, screenings used).....	3 67	5 45
1879, (estimated, screenings used).....	2 62	5 02
1880,.....	3 60	5 15
	\$3 78	\$5 57

A contract was made May 26, 1879 with E. L. Hedstrom & Co., for the delivery of 6,000 tons of Anthracite coal to West pumping works, 2,819 tons have been delivered, leaving a balance of 3,181 tons, which the contractors have failed to furnish.

In the event of an extensive fire occurring in the present, and rapidly increasing lumber district, immediately surrounding the West pumping works, the operations of the works might be interrupted and possibly be damaged, owing to the large number of unprotected windows on the east front. I would therefore recommend that these windows be provided with suitable iron shutters, as a means of protection.

The following is a statement of the work done at the

MACHINE SHOPS.

located on the premises of the North pumping works.

Hydrants, stop-valves, etc., have been manufactured during the year as follows:

NEW HYDRANTS.

Four-inch, (double nozzle)	130
Two-and-a-half-inch, (double nozzle)	30
Two-and-a-half-inch, (single nozzle)	31
Total manufactured	191
Of these there have been put in use	185
On hand January 1st, 1881	6

NEW STOP VALVES.

Four-inch	47
Six-inch	113
Eight-inch	66
Twelve-inch	11
Sixteen-inch	6
Twenty-four-inch	2
Total manufactured	245
Of this number there have been used	211
Leaving on hand January 1st, 1881	34

Of the following sizes, viz.:

Four-inch	5
Six-inch	2
Eight-inch	14
Twelve-inch	10
Sixteen-inch	1
Twenty-four-inch	2
Total	34

The above list includes the hydrants and valves reported on hand January 1st, 1880, which were carried over as "stock" on hand.

In addition to the foregoing work, a number of hydrants and stop-valves have been repaired, and the usual amount of repairing has been done for the various departments of the city.

The total expenditures for labor and material on account of shop, including value of stock on hand, January 1st 1881, is.....\$ 22,867 43

Charged to the following accounts, viz:

Water department, "pumping,"	\$ 586 24	
Water department, operating expenses, ...	1,426 94	
New hydrant and stop-valves	12,106 20	
Pipe extension	468 86	
Fullerton avenue conduit	32 41	
Tapping department	73 02	
Meter department	512 13	
Street department	151 24	
Sewer department	74 88	
Bridge department	408 15	
Harrison street pipe tunnel	12 45	
Clybourne place pipe tunnel	160 62	
City hall repairs	37 79	
River improvement fund	23 23	
Fire department, (coal, repairs of engine, etc.,)	356 76	
Expenses running shop, coal, gas, etc., ...	1,472 80	
Stock on hand January 1st, 1881	4,963 71	
	\$22,867 43	\$22,867 43

The value of the work done in the shop, estimating the same at less than current prices for like articles, is	25,961 17
Add coal, attendance, etc., used by fire department	526 93
	\$26,488 10

Deduct cost as shown.....	\$22,867	43
Deduct 10 per cent. for interest and depreciation of tools, etc., costing \$7,264 62	726	46
Leaving the nominal net earnings of shop,	2,894	21
 Total	\$26,488	10
Cost of tools previously reported	7,065	06
Added by repairs, past year	199	56
 Present value of tools.....	\$7,264	62
Value of stop-valves and hydrants, be- fore noted, as on hand January 1st, 1881, together with the raw material in the shop, is.....	4,964	71
 Total value of stock and tools..	\$12,228	33

THE CONSUMPTION OF WATER

in the city during the past year, as shown, is but little greater than the previous year. The annual increase being less than for the past twenty-two years, during which time the annual increase has varied from about three to thirty-three per cent. The general average for the period being a little over fifteen per cent.

The record shows that in this City the most marked annual increase in the consumption of water has followed immediately after the establishment of increased pumping facilities. For instance, from 1858 to 1867 the highest daily consumption was $8\frac{1}{2}$ million gallons. During the latter year the pumping capacity was largely increased, and the daily consumption of water immediately reached $11\frac{1}{2}$ million gallons. Again in 1872 the daily average delivered was $27\frac{1}{2}$ million gallons, new engines were added, and the quantity delivered at once exceeded 32 million gallons. During 1876 the daily consumption of water reached 42 million gallons. The West works were put in operation at that date, and the average daily quantity pumped during the following year was 52 million gallons.

The water pipes have been, and will in the future, be largely extended in the section of the City nearest to the West works.

We may therefore expect a corresponding increase in the demand for water in that locality. At the present time with the maximum capacity of the West works, it is found that the head of water formerly maintained is gradually decreasing, and will thus continue to an extent equal to the increasing demand for water.

This fact revives the frequently expressed views of this department, upon the importance of completing the West pumping works by the erection of two additional pumping engines. The imperative necessity for this work has been so often and so fully rehearsed in former reports and otherwise, that further reference to the subject at this time may be omitted.

The following table presents some interesting statistics of the past, present and future, in connection with the water works of this City:

TABULAR STATEMENT OF THE CONSUMPTION & WASTE OF WATER, RELATIVE PUMPING CAPACITY, POPULATION, PIPES, REVENUE, ETC.

YEAR.	ACTUAL SUPPLY.	WATER DISTRIBUTED DAILY IN U. S. GALLONS.										WATER RENTS.			TAPS.		PIPE.		POPULATION.			
		Per Cent. of Increase.	Estimated at one-sixth Annual Increase.	Estimate made in 1851 based on 35 Gallons per Inhabitant.	Quantity to each Inhabitant.	Per Cent. of Increase.	Average Quantity per mile of Pipe.	Capacity of Works per mile.	Average quantity for each Tap.	One Dollar per Year.	Capacity of Works.	Proportion of Pumping Capacity to Quantity Supplied.	Amount Collected.	Per Cent. of Increase.	Number of Taps in Use.	Per Cent. of Increase.	Number of Inhabitants to each tap.	Miles of Pipe in Use.		Per Cent. of Increase.	Number of Inhabitants per mile of Pipe.	Total Number.	Per Cent. of Increase.
1858	2,991,413	39.51	3,489,980	2,340,000	32.8	41,317	276,243	641	98.29	30,000,000	1 to 5.7	\$102,179	...	4,666	...	19.5	72.4	...	1,257	91,000	...	
1859	3,877,119	29.31	4,071,644	2,520,000	...	45,559	295,017	705	31.53	30,000,000	1 to 5.0	122,948	30.22	5,511	18.10	...	85.1	17.54	...	1,201	100,500	20.06
1860	4,703,525	21.31	4,701,644	2,700,000	43.0	51,087	313,017	740	35.86	30,000,000	1 to 4.2	131,102	6.68	6,350	15.22	17.2	91.0	6.93	...	1,201	100,500	20.06
1861	4,841,550	2.93	4,750,251	2,880,000	...	50,803	313,017	704	32.21	30,000,000	1 to 4.1	150,200	14.58	6,876	8.28	...	95.3	4.72	...	1,317	138,186	36.47
1862	6,074,739	25.47	5,541,960	3,060,000	43.9	57,909	313,017	705	33.53	30,000,000	1 to 3.2	150,200	14.58	6,876	8.28	...	104.9	10.07	...	1,317	138,186	36.47
1863	6,400,298	5.35	6,465,623	3,420,000	...	55,461	313,017	760	33.53	30,000,000	1 to 3.1	190,886	26.48	8,412	12.91	...	115.4	10.00	...	1,380	169,353	32.55
1864	6,913,259	8.01	7,543,223	3,780,000	40.8	54,306	313,017	707	30.87	30,000,000	1 to 2.9	224,246	17.47	11,406	15.75	...	127.3	10.31	...	1,264	178,492	...
1865	7,610,459	10.08	8,800,497	4,140,000	...	53,899	313,017	667	30.84	30,000,000	1 to 2.6	292,441	12.57	11,406	15.75	...	141.2	10.91	...	1,264	178,492	...
1866	8,681,536	14.07	10,267,165	4,544,000	43.3	58,310	313,017	637	30.13	30,000,000	1 to 2.3	397,468	12.06	16,408	21.00	...	152.2	7.80	...	1,316	200,418	18.34
1867	11,592,273	33.18	11,978,329	5,390,000	...	63,145	313,017	701	34.34	38,000,000	1 to 1.7	420,656	94.65	30,915	26.77	...	174.8	14.84	...	1,208	252,054	25.76
1868	14,724,999	27.35	16,303,878	6,140,000	58.4	70,589	313,017	658	34.09	38,000,000	1 to 1.6	420,656	94.65	30,915	26.77	...	208.6	19.33	...	1,208	252,054	25.76
1869	18,633,278	26.54	19,021,101	6,330,000	79.8	77,670	313,017	639	34.09	38,000,000	1 to 1.6	420,656	94.65	30,915	26.77	...	208.6	19.33	...	1,208	252,054	25.76
1870	21,706,260	16.63	20,204,947	6,752,000	72.5	79,800	313,017	639	34.09	38,000,000	1 to 1.6	420,656	94.65	30,915	26.77	...	208.6	19.33	...	1,208	252,054	25.76
1871	23,464,877	7.80	22,112,298	7,004,000	74.5	81,568	313,017	648	33.58	38,000,000	1 to 1.6	446,945	17.36	38,110	7.92	8.4	8.2	297.7	5.01	1,130	325,000	23.63
1872	27,536,819	17.35	30,204,947	7,544,000	...	84,065	313,017	629	33.58	38,000,000	1 to 1.6	446,945	17.36	38,110	7.92	8.4	8.3	310.8	8.02	1,188	369,293	23.63
1873	32,117,312	16.63	30,204,947	8,004,000	...	94,387	313,017	592	45.31	74,000,000	1 to 1.3	708,934	30.32	47,965	12.90	...	351.4	13.06	...	1,023	395,408	7.07
1874	38,000,952	18.60	35,239,104	8,582,000	...	97,760	313,017	534	53.94	74,000,000	1 to 1.3	708,934	30.32	47,965	12.90	...	351.4	13.06	...	1,023	395,408	7.07
1875	39,844,556	4.60	41,112,298	9,494,000	...	97,760	313,017	534	53.94	74,000,000	1 to 1.3	708,934	30.32	47,965	12.90	...	351.4	13.06	...	1,023	395,408	7.07
1876	41,931,481	5.23	47,964,397	10,000,000	...	100,700	313,017	504	53.94	74,000,000	1 to 1.3	831,553	17.79	57,190	7.23	...	410.0	6.10	...	977	407,000	2.93
1877	52,183,892	24.45	55,968,353	10,000,000	...	122,878	313,017	577	57.77	104,000,000	1 to 1.0	942,190	8.52	89,369	3.91	...	424.5	1.96	...	1,016	436,731	7.30
1878	53,600,780	2.71	65,284,792	10,000,000	...	127,110	313,017	801	56.77	104,000,000	1 to 1.0	942,190	8.52	89,369	3.91	...	424.5	1.96	...	1,016	436,731	7.30
1879	56,322,441	5.07	76,165,590	10,000,000	...	137,613	313,017	886	61.08	104,000,000	1 to 1.5	992,011	2.24	63,510	3.46	...	443.1	3.07	...	1,070	474,400	...
Average for 21 years.	...	15.30	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	17.26

The following estimate for the next five years is based on the result of the last twenty-one years, as shown above.

1880	57,881,552	2.16	57,881,552	112.0	114.9	127,665	325,740	887	60.24	101,000,000	1 to 1.7	903,051	...	66,312	...	7.7	460.7	...	1,111	512,000	17.26
1881	58,304,761	...	58,304,761	112.0	...	128,370	325,740	887	60.24	101,000,000	1 to 1.8	860,369	...	67,949	...	7.00	455.4	...	1,111	512,000	17.26
1882	63,030,773	...	63,030,773	106.4	...	138,910	325,740	889	61.53	104,000,000	1 to 1.61	1,089,131	...	71,916	...	8.3	496.0	...	1,162	530,250	...
1883	63,030,773	...	63,030,773	106.4	...	138,910	325,740	889	61.53	104,000,000	1 to 1.61	1,089,131	...	71,916	...	8.3	496.0	...	1,162	530,250	...
1884	63,030,773	...	63,030,773	106.4	...	138,910	325,740	889	61.53	104,000,000	1 to 1.61	1,089,131	...	71,916	...	8.3	496.0	...	1,162	530,250	...
1885	63,030,773	...	63,030,773	106.4	...	138,910	325,740	889	61.53	104,000,000	1 to 1.61	1,089,131	...	71,916	...	8.3	496.0	...	1,162	530,250	...
1886	63,030,773	...	63,030,773	106.4	...	138,910	325,740	889	61.53	104,000,000	1 to 1.61	1,089,131	...	71,916	...	8.3	496.0	...	1,162	530,250	...
1887	63,030,773	...	63,030,773	106.4	...	138,910	325,740	889	61.53	104,000,000	1 to 1.61	1,089,131	...	71,916	...	8.3	496.0	...	1,162	530,250	...
1888	63,030,773	...	63,030,773	106.4	...	138,910	325,740	889	61.53	104,000,000	1 to 1.61	1,089,131	...	71,916	...	8.3	496.0	...	1,162	530,250	...
1889	63,030,773	...	63,030,773	106.4	...	138,910	325,740	889	61.53	104,000,000	1 to 1.61	1,089,131	...	71,916	...	8.3	496.0	...	1,162	530,250	...
1890	63,030,773	...	63,030,773	106.4	...	138,910	325,740	889	61.53	104,000,000	1 to 1.61	1,089,131	...	71,916	...	8.3	496.0	...	1,162	530,250	...

The following estimate for the next five years is based on the result of the past twenty-one years, as shown above.

YEAR.	ACTUAL SUPPLY.	Per Cent. of Increase.	Estimated at one-tenth Annual Increase.	Estimate made in 1831 based on 35 Gallons per Inhabitant.	Quantity to each Inhabitant.	Per Cent. of Increase.	Average Quantity of Pipe.	Capacity of Works per mile.	Average quantity for each Tap.	One Dollar per Year.	Capacity of Works.	Proportion of Pumping Capacity to Quantity Supplied.	Amount Collected.	Per Cent. of Increase.	Number of Taps in Use.	Per Cent. of Increase.	Number of Inhabitants to each tap.	Miles of Pipe in Use.	Per Cent. of Increase.	Number of Inhabitants per mile of Pipe.	Total Number.	Per Cent. of Increase.	
1880	58,841,523	...	...	...	...	...	127,765	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1881	57,384,376	2.16	...	...	...	...	127,765	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1882	61,400,693	...	...	...	...	...	127,765	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1883	63,930,774	...	...	...	...	...	127,765	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1884	66,478,885	...	...	...	...	...	127,765	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1885	69,017,966	...	...	...	...	...	127,765	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

*—Municipal year changed from April 1st to January 1st. The items are for nine months only. †—An average of about 1,219,000 galls. were used by water engines.
‡—A trifle over two per cent. of this quantity was used by water engines.
§—Decrease. ¶—Estimated.

The following table will also be of interest, mainly in showing the cost of water supply in the various cities named, as compiled from official reports:

YEAR.	CITY.	Total cost of Works entire.	Population.	Cost per capita.	Miles of pipe in use.	Population per mile of pipe.	Daily average consumption. (Gallons.)	Quantity to each inhabitant.
1880	Detroit, Mich.....	\$ 2,750,700	119,000	\$23.11	209	569	15,172,036	127.5
1880	Newark, N. J.....	2,671,580	140,000	19.08	136½	1027	9,386,064	67
1880	Wilmington, Del.....	912,120	44,000	20.73	51.65	851	3,564,856	81
1880	Albany, N. Y.....	.....	85,000	.....	77½	1099	8,500,000	100
1880	Buffalo, N. Y.....	3,000,000	164,000	18.29	.....	.....	20,000,000	122
1880	Cincinnati, O.....	6,813,000	200,000	26.20	188.86	1376	19,476,739	75
1880	Milwaukee, Wis.....	2,227,482	115,702	19.25	90.87	1273	12,209,000	106
1880	Columbus, O.....	943,513	52,000	18.14	50.5	1029	2,154,794	41.4
1879	Louisville, Ky.....	3,906,141	156,000	25.04	108.84	1433	5,172,689	33.16
1880	Cleveland, O.....	2,628,319	156,000	16.84	125.6	1242	10,179,461	65.2
1880	Providence, R. I.....	5,530,347	104,850	52.74	155.27	675	3,547,264	39.8
1880	Boston, Mass.....	18,320,000	*412,000	44.46	490	841	35,887,900	87.1
1880	Manchester, N. H.....	860,000	33,000	24.24	33.5	985	1,180,930	35.8
1880	Hartford, Conn.....	1,495,519	42,000	35.60	71.6	586	5,000,000	119
1878	New York.....	35,820,081	†1,041,886	34.38	463.6	2247	93,400,000	89.6
1879	Philadelphia.....	18,793,519	‡817,500	23.00	730.2	1119	54,507,518	66.6
1879	St. Louis.....	.....	1400,000	.....	199.6	2004	24,958,000	62.3
1879	Brooklyn.....	.....	1485,000	.....	347.7	1394	32,912,149	67.8
1880	CHICAGO, ILL.....	\$8,802,725	503,304	17.49	455.4	1105	57,384,376	114

* Includes the towns of Chelsea, Summerville, and Everett, which are supplied by the works.

† Year 1875.

‡ Year 1877.

PIPE EXTENSION.

Since date of last report, $16\frac{2763}{280}$ miles of pipe have been laid in connection with the necessary stop valves and hydrants. The principal pipe laid during the year is the continuation of the line of 36-inch main from foot of East Harrison street across the river; thence west on Harrison street to Blue Island avenue; thence southwest as far as Fifteenth street, at which point the work was suspended, owing to cold weather. As soon as the work of laying can be resumed, this pipe will be extended to and connected with the West pumping works. It was intended to continue this pipe direct on Blue Island avenue, but the masonry abutments, piers and walls constituting the substructure of the double viaduct over the railroad tracks known as the Sixteenth Street Crossing presents so much of a barrier, and involves so large an expense to cut the walls, that a detour is to be made via Rebecca and Loomis streets, and thus go

around the viaduct and enter upon Blue Island avenue one block beyond.

From the west side of the river the 36-inch pipes are laid on a line of the curb wall of the streets, or in sidewalk space, to a point between Canal and Clinton streets, where the pipes are carried to the south of curb wall, on which line they are continued west to Blue Island avenue.

The 16-inch main to connect the pipe of like size on east and west side of the north branch of river at Clybourne place has also been completed.

With the exception of these mains the pipes laid range from 6 to 8 inch in diameter. A small amount only of 4 inch has been laid.

A line of 8-inch pipe has been laid on Lumber street, from Eighteenth to Jefferson, and well supplied with double 4-inch nozzle hydrants. This pipe is mainly for fire service in an extensive lumber region, and is amply supplied with water from a 24-inch main on Eighteenth street.

In a number of other important localities small pipes have been replaced with larger ones and supplied with large hydrants.

A line of 4-inch pipe was laid on Van Buren street, from Wood to Paulina streets, through rock, which was removed by blasting.

There is considerable pipe in this section of the city laid on the top of rock, leaving the pipe so near the surface that it is liable to damage by frost. The rock will be removed next season and the pipe lowered beyond the action of frost.

A small amount of pipe laid in former years at the expense of private parties, has, during the past year, been included in the general pipe system, and the amount deposited with the Department has been refunded.

The following tabulated pages comprise a list of pipes laid for the year ending December 31, 1880.

SOUTH DIVISION.

ON WHAT STREET.	BETWEEN WHAT STREETS.	Length in Feet.	Diam. in inches.
Arnold street.....	Twenty-fourth street and southward..	211	6
Butler street.....	McGregor street and Archer avenue...	596	6
Butler street.....	Napoleon place to Twenty-ninth street..	306	6
Butler street.....	Twenty-fifth street to Kossuth street..	300	6
Calumet avenue.....	Thirty-first st. to Thirty-second st....	600	6
Congress street....	Crossing Michigan avenue.....	38	8
Congress street....	Fifth avenue to Market street.....	630	8
Couch place.....	Clark street and LaSalle street.....	320	6
Couch place.....	State street and eastward.....	260	8
Dashiel street.....	*Thirtieth street to Thirty-first street.	690	4
Dashiel street.....	Twenty-ninth street to Thirtieth street	592	4
Dashiel street.....	Twenty-ninth street and northward.....	382	6
Ellis avenue.....	117 ft. south of Egan ave. and southward	46	4
Emerald avenue....	Twenty-ninth street and northward..	400	6
Fifth avenue.....	Taylor street to Harrison street.....	1,609	8
Fifth avenue.....	Thirty-third street and northward.....	132	4
Fourth avenue.....	Jackson street to Harrison street.....	1,137	8
Grove street.....	Stewart avenue and southward.....	170	6
Groveland Park ave.	Thirtieth street and southward.....	185	4
Haddock place.....	Franklin street to Fifth avenue.....	340	6
Haddock place.....	LaSalle street to Fifth avenue.....	300	8
Haddock place.....	Wabash avenue and eastward.....	225	6
Hanover street....	Thirty-first and Thirty-second street..	643	4
Iglehart street....	Twenty-eighth and Twenty-seventh sts	472	6
Jackson street....	Crossing Market street.....	30	8
Lake Park avenue..	Thirtieth street and southward.....	236	4
Market street....	Adams street and Van Buren street...	915	8
Market square....	*Archer avenue and Thirty-first street.	450	4
McDermott street..	Archer avenue and northward.....	360	6
Michigan avenue..	Madison street to Jackson street.....	1,409	8
Michigan avenue..	Van Buren street to Harrison street...	910	8
Michigan avenue..	South Water street to Madison street..	1,337	8
Monroe street....	Crossing Michigan avenue.....	40	6
Portland avenue...	Thirty-fifth street and southward.....	462	4
Quincy street....	Crossing Market street.....	30	8
Robertson street..	*Thirty-first street and northward.....	797	4
Sherman street....	Crossing Taylor street.....	27	6
Sherman street....	Van Buren street to Jackson street....	421	6
State street.....	Thirty-sixth street and northward....	384	8
Taylor street....	Fifth avenue and Pacific avenue.....	540	6
Thirtieth street...	Butterfield street to Clark street.....	90	6
Thirtieth street...	Cottage Grove ave. to Lake Park ave..	500	6
Thirtieth street...	Dearborn street to State street.....	240	6
Thirtieth street...	South Park ave. to Cottage Grove ave.	763	6
Thirty-fifth street.	Fifth avenue to Portland avenue.....	295	8
Thirty-fifth street.	307 ft. east of Lincoln street westward.	517	6
Thirty-first street..	Market square to Robertson street...	132	4
Thirty-seventh st..	Stanton avenue to Boulevard.....	630	8
Twenty-eighth st..	Cottage Grove ave. to east of Iglehart st	211	6
Twenty-ninth st..	Cottage Grove ave to Lake Park ave..	460	8
Van Buren street...	Crossing Michigan avenue.....	38	8
Vernon avenue....	Connection at Thirty-seventh street...	16	6
Wallace street.....	Thirty-fifth st. to Thirty-sixth st.....	640	6
		23,464	
	Branch pipe for hydrants.....	1,000	
	Total in South Division.....	24,464	

WEST DIVISION.

ON WHAT STREET.	BETWEEN WHAT STREETS.	Length in Feet.	Diam. in Inches.
Adams street.....	Western avenue and eastward.....	450	6
Ashland avenue....	Congress street to Harrison street....	260	6
Ashland avenue....	Twelfth street to Harrison street....	2,500	8
Blue Island avenue..	Harrison street to Fifteenth street....	5,550	36
Brown street.....	Eighteenth street to Nineteenth street..	488	6
Canal street.....	Across Fulton street.....	100	8
Carroll avenue.....	*Sacramento street and eastward.....	200	4
Central Park ave....	Ogden avenue and southward.....	750	4
Central Park ave....	Twenty-fifth st. & N. of Twenty-third st.	1,524	4
Clybourne place....	Elston avenue to River Tunnel.....	584	16
Congress street....	Across Halsted street.....	30	6
Congress street....	Ashland avenue and Laflin street.....	565	6
Congress street....	Wood street to Winchester avenue....	853	6
Dickson street.....	Bloomington Road and southward.....	330	4
Eighteenth street..	Ashland avenue to Paulina street.....	667	6
Elizabeth street....	Madison street to Washington street..	530	6
Elizabeth street....	Randolph street to Carroll avenue....	1,095	6
Fleetwood street....	Blanche street to Blackhawk street....	735	6
Fourteenth street..	Western avenue to Campbell avenue....	591	4
Fulton street.....	Canal street to west of Jefferson street	1,100	8
Genesee avenue....	Twenty-third street to Twenty-fifth st	1,306	4
Harrison street....	Halsted street to Ellsworth street....	2,800	36
Holt street.....	Blackhawk street to Blanche street....	664	6
Honore street.....	Across Congress street.....	69	6
Irving avenue.....	Monroe street and southward.....	189	6
Irving avenue.....	Across Jackson street.....	36	6
Jackson street.....	Canal street to Halsted street.....	2,055	8
Jackson street.....	Loomis street and Laflin street.....	663	6
Jackson street.....	Seeley avenue and Hamilton avenue....	589	6
Jackson street.....	Throop street to Loomis street.....	665	6
Jackson street.....	Western avenue and Irving avenue....	1,223	6
Jefferson street....	Carroll avenue to Madison street....	2,340	8
Jefferson street....	Across Jackson street.....	80	8
Johnson street....	Sixteenth street to Eighteenth street..	662	6
Kansas street.....	Across Ashland avenue.....	75	6
Laflin street.....	Across Jackson street.....	72	6
Lake street.....	Wood street to Western avenue.....	4,011	8
Leavitt street.....	Twentieth street to Twenty-first street	335	6
Lincoln street.....	Across Congress street.....	84	6
Lincoln street.....	Jackson street to VanBuren street....	450	6
Loomis street.....	Nineteenth street to Zion place.....	330	8
Lumber street.....	Jefferson street to Eighteenth street..	2,514	8
Lumber street.....	Maxwell street to Fourteenth street....	353	4
Morgan street....	Sixteenth street to Eighteenth street..	675	6
Nebraska street....	Crossing Ashland avenue.....	75	6
Nineteenth street..	Oakley street and Western avenue....	627	4
Nineteenth street..	Throop street and Loomis street.....	653	8
Oakley avenue.....	Crossing Jackson street.....	78	6
Oakley avenue.....	Twenty-first street and Nineteenth st..	677	4
Polk street.....	Campbell avenue and eastward.....	135	6
Quincy street.....	Desplaines street and westward.....	430	6
Robey street.....	Madison street and Lake street.....	1,056	6
Amount carried forward.....		44,773	

WEST DIVISION—CONTINUED.

ON WHAT STREET.	BETWEEN WHAT STREETS.	Length in Feet.	Diam. in inches.
	Amount brought forward	44,773	
Sacramento street..	*Carroll avenue to Sacramento square.	754	4
Seymour street....	Hirsch street and southward	306	6
Sixteenth street....	Ashland avenue and Paulina street.....	587	6
Talman street.....	Fulton street and northward	300	4
Thirteenth place...	Wood street and Lincoln street.....	627	6
Twenty-second st..	Millard avenue and Bonney avenue.....	605	6
Twenty-sixth street	Western avenue and westward	808	8
Twenty-third street	Central Park avenue and Genesee ave.	664	6
VanBuren street....	Winchester avenue to Lincoln street...	332	8
VanBuren street....	Ogden avenue to Honore street	133	6
Washington street..	West line Union street to Halsted st...	430	6
Washington street..	Clinton street to east line Union street.	1,145	8
Washington street..	Crossing Elizabeth street.....	95	6
York street.....	Crossing Ashland avenue	75	6
Zion place.....	Loomis street and Throop street	666	6
		52,300	
	Branch pipe for hydrants.....	1,850	
	Total in West Division.....	54,150	

NORTH DIVISION.

ON WHAT STREET.	BETWEEN WHAT STREETS.	Length in Feet.	Diam. in inches.
Astor street.....	60 ft. north of Scott st. to Division st..	422	8
Burling street.....	Across North avenue	50	6
Cass street.....	Ontario street and northward.....	35	6
Church street.....	Across North avenue	100	6
Clark street.....	Centre street to Wisconsin street.....	650	6
Clark street.....	Menomonee street to Park place.....	173	6
Clark street.....	North avenue to Eugenie street	660	6
Clybourne avenue..	Racine avenue and northward	687	6
Clybourne place....	Southport avenue to Water Pipe Tunnel	370	16
Division street.....	Hickory street and eastward	115	6
Division street.....	Stone street to Astor street.....	290	8
Eugenie street.....	Clark street pipe and westward.....	94	6
Franklin street.....	Starr street to Eugenie street.....	318	4
Franklin street.....	Across North avenue	100	8
Goethe street.....	Dearborn avenue to State street.....	290	6
Illinois street.....	Across St. Clair street.....	94	8
Indiana street.....	Across St. Clair street.....	97	8
LaSalle street.....	Michigan street and southward	100	8
Lane place.....	Centre street to Sophia street.....	660	4
Locust street.....	LaSalle street to Clark street	350	6
Mohawk street.....	Across North avenue	100	6
Orchard street.....	Across North avenue	40	6
Park place.....	Clark street to Wells street.....	120	6
Scott street.....	Across Astor street.....	75	6
St. Clair street.....	Michigan street to Indiana street.....	538	8
Wisconsin street....	Clark street to Franklin street.....	288	8
Wesson street.....	Chicago avenue to Oak street.....	1,390	8
		8,154	
	Branch pipe for hydrants.....	375	
	Total in North Division.....	8,529	

RECAPITULATION.

DIVISION.	DIAMETER OF PIPES.					Total in feet.
	4-inch.	6-inch.	8-inch.	16-inch.	36-inch.	
South.....	4,365	8,687	10,412			23,464
West.....	7,412	18,086	17,968	584	8,350	52,400
North.....	978	3,487	3,319	370		8,154
Totals.....	12,755	30,260	31,699	954	8,350	84,018

Total amount of branch pipe for hydrants.... 3,225

Grand total length of pipe laid during the year, $16\frac{2763}{5280}$ miles, or ft.. 87,243

*This pipe was laid at the expense of private parties, under rule of department; as soon as it pays the required revenue, the money advanced to cover costs of laying will be refunded.

There is also a quantity of pipe (laid as branches, connecting the distributing pipes with elevator engines, water meters), etc. Some of this pipe is owned by the city, and a portion is the property of individuals.

PIPE TAKEN UP OR ABANDONED.

The pipe taken up or abandoned during the year, and the pipe substituted therefor, are shown in the following tabulated list:

ON WHAT STREET.	LOCATION OF PIPE.	Removed.		Re-laid.	
		Length in feet.	Diam. in inches.	Length in feet.	Diam. in inches.
Burling street....	Across North avenue.....	50	4	50	6
Canal street.....	Fulton street and southward...	100	4	100	8
Cass street.....	Across Ontario street.....	35	4	35	6
Church street....	Across North avenue.....	100	4	100	6
Couch place.....	State street and eastward.....	260	4	260	8
Desplaines street.	Under Viaduct.....	150	6		
Elizabeth street..	Madison st. and Washington st.	530	4	530	6
Elizabeth street..	Randolph st. and Lake st.....	450	4	450	6
Franklin street...	Across North avenue.....	100	4	100	8
Haddock place...	Fifth ave. and Franklin st.....	340	3	340	6
Iglehart street...	Twenty-seventh st. and Twenty- eighth st.....	76	4	76	6
Illinois street....	Across St. Clair street.....	94	4	94	8
Indiana street....	Across St. Clair street.....	97	4	97	8
Jackson street....	Hamilton ave. and Hoyne ave...	289	4	289	6
Jackson street....	Throop street and Loomis street	665	4	665	6
Lake street.....	Wood st. and Western ave.....	4,011	4	4,011	8
Locust street....	Clark street and westward.....	350	4	350	6
Michigan avenue.	Harrison st. and S. Water st....	3,656	3	3,656	8
Michigan avenue.	Randolph st. and Lake st.....	400	6		
Mohawk street....	Across North avenue.....	100	4	100	8
Orchard street....	Across North avenue.....	40	4	40	6
Robey street....	Lake street and northward.....	50	4	50	6
Washington st....	Across Elizabeth street.....	95	4	95	6
Washington st....	Desplaines st. and Union st.....	400	4	400	8
Washington st....	Union st. and Halsted st.....	430	4	430	6
		12,868		12,318	

The following tabulated list comprises amount of pipe, as near as can be ascertained, in use in the city, at the close of the year 1880.

CAST IRON MAIN PIPES.

DIAM. OF PIPE.	*1879.			1880.		Grand Total.
	Amount in Feet in Use.	Am't in Feet Taken Up.	Actual Am't in Ft. in use.	Am't Laid in feet.	Am't in Feet taken up.	
36 inch	27,030	.....	27,030	8,350	.....	35,830
30 "	18	.....	18	.....	.....	18
28 "	160	.....	160	.....	.....	160
24 "	67,979	.....	67,979	.....	.....	67,979
16 "	57,212	.....	57,212	954	.....	58,166
12 "	127,995	.....	127,995	.....	.....	127,995
10 "	8,012	.....	8,012	.....	.....	8,012
8 "	442,968	.....	442,968	31,699	.....	474,667
6 "	890,460	3,329	887,131	30,260	550	916,841
4 "	693,906	5,852	688,054	12,755	8,322	692,487
3 "	21,240	297	20,943	.....	3,996	16,947
Totals	2,336,980	9,478	2,327,502	84,018	12,868	2,398,652

24 inch wrought iron syphon pipe at 12th street.....	258
4 and 6 inch cast iron pipe for hydrant branches for 1879.....	2,500
4 and 6 inch cast iron pipe for hydrant branches for 1880.....	3,225

Grand total in feet 2,404,635
or $455^{2225}/_{6280}$ miles.

RECAPITULATION.

*Total amount of pipe reported in use in 1879, 2,339,738 ft.
Less am't of pipe taken up or abandoned 1879, 9,478 "

Actual amount in use in 1879.....	2,330,260 ft.	$=441^{1780}/_{6280}$ miles.
Total amount new pipe laid in 1880.....	75,543 "	} $16^{2762}/_{6280}$ "
Total amount old pipe laid in 1880.....	8,475 "	
Total am't pipe for hydrant branches in 1880,	3,225 "	

Totals.....	2,417,503 ft.	$457^{4642}/_{6280}$ miles.
Less amount pipe taken up or abandoned ...	12,868 "	$2^{2508}/_{6280}$ "

Grand total am't in use at close of the year
1880..... $2,404,635$ ft. or $455^{2225}/_{6280}$ miles.

* In the Annual Report for 1879, the pipe taken up or abandoned was not deducted from grand total in use. By reference to the foregoing Table and Recapitulation the error will be found corrected.

STOP VALVES

The following is a record of the number, size and location of the stop valves put in during 1880:

SOUTH DIVISION.

LINE OF PIPE.	LOCATION.	SIZE OF VALVES.						
		4"	6"	8"	12"	16"	24"	36"
Arnold street...	South line Twenty-fourth street.		1					
Butler street...	South line Twenty-fourth street.		1					
Couch Place...	6 ft. West of West line Clark st.		1					
Dashiel street...	South line Twenty-ninth street.		1					
Franklin street...	South line Madison street.....			1				
Fifteenth street.	East line Clark street.....		1					
Haddock place.	East line Wabash avenue.....		1					
Haddock place.	West line Fifth avenue.....		1					
Haddock place.	East line Fifth avenue.....			1				
Haddock place.	East line Franklin street.....			1				
Haddock place.	West line LaSalle street.....			1				
Hanover street.	South line Thirty-first street.	1						
Michigan ave...	South line Randolph street.....			1				
Michigan ave...	So. line Randolph st., Blow-off..	1						
Michigan ave...	North line Lake street.....			1				
Michigan ave...	North line Madison street.....			1				
Portland ave...	South line Thirty-fifth street...	1						
Randolph street	West line Michigan avenue.....		1					
Thirtieth street.	East line Clark street.....		1					
Taylor street...	West line Clark street.....		1					
Thirty-sixth st.	West line Wallace street.....		1					
South Water st.	West line Michigan avenue.....			1				
Wallace street...	South line Thirty-fifth street...		1					
Michigan ave...	*South line Madison street.....			1				
Michigan ave...	*South line Van Buren street...			1				
Michigan ave...	*North line Adams street.....			1				
Tw'ty-eighth st	*East line Cottage Grove ave...		1					
Total for South Division.....		3	15	10				
Previously put in.....		133	331	293	50	10	11	3
Totals.....		136	346	303	50	10	11	3
Less by Valves taken out.....		4						
Grand Totals for South Div...		132	346	303	50	10	11	3

*Substituted for smaller Valves.

WEST DIVISION.

LINE OF PIPE.	LOCATION.	SIZE OF VALVES.						
		4"	6"	8"	12"	16"	24"	36"
Ashland avenue.	South line Taylor street.....			1				
Ashland avenue.	South line Polk street.....			1				
Blackhawk st...	20 ft. E. of East line Fleetwood st	1						
Blue Island av..	North line Thirteenth place....						1	
Blue Island av..	Intersection Twelfth st., Feeder			2		2		
Carroll avenue..	East line Sacramento avenue...	1						
Canal street....	South line Fulton street.....			1				
Canal street....	North line Fulton street.....			1				
Canal street....	North line Harrison st., Feeder..					1		
Clinton street..	North line Washington street...			1				
Clinton street..	North line Wash'n st., Blow-off..	1						
Clybourne place	West of Water Pipe, Tun'l Shaft					1		
Clybourne place	Mendel st., Feeder Connection.		2					
Clybourne place	52 feet East of Elston avenue...		1					
Central Park ave	South line Twenty-fourth street.	1						
Congress street	West line Wood street.....		1					
Dickson street..	South line Bloomingdale road...	1						
Elizabeth st....	North line Washington street...		1					
Eighteenth st..	West line Ashland avenue.....		1					
Fulton street...	West line Clinton street.....			1				
Fulton street...	East line Clinton street.....			1				
Fourteenth st..	West line Western avenue.....	1						
Geneſee ave....	South line Twenty-fourth street.	1						
Harrison street.	East of E. line Halsted st., Feed'r				1			
Holt street.....	North line Blackhawk street....		1					
Irving avenue..	Monroe st., Feeder Connection..		1					
Jefferson street.	Fulton st., Feeder Connection..			1				
Jefferson street.	North line Fulton street.....			1				
Jefferson street.	North line Madison street.....			1				
Jefferson street.	North line Washington street...			1				
Jefferson street.	South line Randolph street.....			1				
Jefferson street.	North line Randolph street.....			1				
Jackson street..	West line Loomis street.....		1					
Jackson street..	West line Desplaines street.....			1				
Jackson street..	West line Clinton street.....			1				
Johnson street.	South line Sixteenth street.....		1					
Lake street....	West line Hoyne avenue.....			1				
Lake street....	Jeffer'n Con'n, bet. 8-in & 6-in pipe		1					
Lake street....	West line Oakley avenue.....			1				
Leavitt street..	North line Lake street.....		1					
Lincoln street..	North line Lake street.....		1					
Lumber street..	West line Seward street.....			1				
Lumber street..	West line Stewart avenue.....			1				
Oakley avenue..	North line Lake street.....		1					
Quincy street..	West line Desplaines street.....		1					
Robey street...	North line Lake street.....		1					
Robey street...	North line Warren avenue.....		1					
Robey street...	North line Washington street...		1					
Seymour street.	South line Hirsch street.....		1					
Sacramento ave	North line Kinzie street.....	1						
Talman street..	North line Fulton street.....	1						
Thirteenth place	West line Wood street.....		1					
Amount carried forward		8	21	21	1	4		1

WEST DIVISION—CONTINUED.

LINE OF PIPE.	LOCATION.	SIZE OF VALVES.						
		4"	6"	8"	12"	16"	24"	30"
	Amount brought forward	8	21	21	1	4		1
Twenty-third st.	West line Central Park avenue . .		1					
Van Buren st.	West line Lincoln street			1				
Washington st.	West line Clinton street			1				
Washington st.	East line Desplaines street			1				
Washington st.	East line Union street			1				
Washington st.	West line Union street			1				
Washington st.	East line Halsted street		1					
Washington st.	East line Elizabeth street		1					
Zion place	West line Throop street		1					
Elizabeth street	*South line Lake street		1					
Lake street . . .	*West line Wood street			1				
Lake street . . .	*West line Lincoln street			1				
Lake street . . .	*West line Robey street			1				
Lake street . . .	*West line Leavitt street			1				
Morgan street . .	*South line Sixteenth street . . .		1					
Washington st.	*West line Halsted street		1					
Washington st.	*West line Elizabeth street . . .		1					
	Total for West Division	8	29	30	1	4		1
	Previously put in	344	613	441	58	31	15	2
	Totals	352	642	471	59	35	15	3
	Less by Valves taken out	7		1				
	Grand Totals for West Div. . . .	345	642	470	59	35	15	3

*Substituted for smaller Valves.

NORTH DIVISION.

LINE OF PIPE.	LOCATION.	SIZE OF VALVES.						
		4"	6"	8"	12"	16"	24"	36"
Astor street...	North line Division street.....			1				
Clyde street...	East line Clybourne avenue.....		1					
Clybourne place	East of water pipe tunnel shaft					1		
Clybourne place	Southport avenue feeder.....		1					
Division street.	East line Hickory street.....		1					
Eugene street..	West line Clark street.....		1					
Franklin street.	South line North avenue.....	1						
Hurlbut street..	South line North avenue.....		1					
Indiana street..	West line St. Clair street.....			1				
Illinois street..	West line St. Clair street.....			1				
Lewis street....	North line Clybourne avenue....		1					
Lane place.....	North line Centre street.....	1						
Lane place.....	South line Sophia street.....	1						
Locust street...	West line Clark street.....		1					
Park place.....	West line Clark street.....		1					
St. Clair street.	South line Illinois street.....			1				
St. Clair street.	South line Indiana street.....			1				
St. Clair street.	Indiana street feeder connection	1						
Smith avenue...	South line North avenue.....		1					
Wesson street..	North line Chicago avenue.....			1				
Wesson street..	South line Oak street.....			1				
Willow street...	West line Clybourn avenue.....		1					
Wisconsin street	West line Clark street.....			1				
St. S. of Clyde st	West line Clybourn avenue.....		1					
Total for North Division.....		4	11	8		1		
Previously put in.....		169	245	201	25	8	8	1
Grand totals for North Div...		173	256	209	25	9	8	1

RECAPITULATION.

DIVISION.	SIZE OF VALVES.							Totals.
	4 inch.	6 inch.	8 inch.	12 inch.	16 inch.	24 inch.	36 inch.	
South.....	132	346	303	50	10	11	3	855
West.....	345	642	470	59	35	15	3	1,569
North.....	173	256	209	25	9	8	1	681
Grand total in the city	650	1,244	982	134	54	34	7	3,105

FIRE HYDRANTS.

The long-continued severe weather of the present winter has exacted extra vigilance to guard the hydrants from the effects of frost. The pipe district has been divided into sections, and a party of men properly equipped, with suitable facilities for keeping the hydrants free from frost, is assigned to each section. The hydrants have thus been protected and kept in working order.

Most of the hydrants in the business portion of the city are protected with sawdust. So long as this material is kept dry it answers the purpose fairly, but it is difficult to maintain it in this condition. In most cases the sawdust is wet, and in cold weather freezes and becomes useless for the purpose intended. A large number of hydrants have been repacked during the winter, and it is believed they have in all cases been found ready for use when wanted, as little trouble or complaint has been reported in this regard by the Fire Department.

In several localities where the flow of water through house service pipes has been stopped by frost, the occupants are supplied with water from adjacent fire hydrants, it being difficult to make immediate repairs owing to the unusual depth to which the ground is frozen.

Most of the hydrants put in during the past year are of the double 4-inch nozzles. As usual the Fire Marshal has generally been consulted with reference to location of hydrants.

Most of the repairs necessary to be made to the hydrants are due to the carelessness or ignorance of inexperienced persons, who are permitted to use them for purposes other than fire service. A great many hydrants are used through the summer months by street sprinklers, and many by the Sewer Department and by various contractors. Public fire hydrants cannot be used except for fire purposes without a permit, and such permit should designate the particular hydrant or hydrants that are to be used. Street sprinklers should be provided with an independent attachment to the hydrant exclusively for their use.

The enforcement of these requirements will largely preserve the hydrants, relieve the Fire Department of frequent embarrassment, and reduce the expense for repairs.

The large "Lowery" hydrant put in on trial at the intersection of Lake and State streets was not used by the Fire Department, and was, therefore, at suggestion of the maker, taken out May 11th last, the city holding it subject to order of owners.

During the past year the post portion of 2,987 hydrants were cleaned and painted at an average cost of a trifle less than eighteen cents each.

The following list gives the number, size and location of hydrants added to the pipe system:

HYDRANTS.

NUMBER PUT IN DURING 1880.

SOUTH DIVISION.

CORNER	WHERE LOCATED.	Size of Hydrants.		
		4 Inch Double.	2 1/2 Inch Double.	2 1/2 Inch Single.
N. W.	Butler street and Twenty-ninth street			1
N. W.	Congress street and Franklin street	1		
N. W.	Dashiel street and Twenty-ninth street			1
N. W.	Dashiel street and Thirtieth street			1
N. W.	Emerald street and Twenty-ninth street			1
N. W.	Fifth avenue and Haddock place	1		
N. W.	Fifth avenue and Thirty-third street			1
N. W.	Hanover street and Thirty-second street			1
S. W.	Iglehart place, 220 ft. north of Twenty-eighth street ..		1	
S. W.	Iglehart place and Twenty-seventh street		1	
S. W.	La Salle street and Haddock place	1		
S. W.	Lake Park avenue and Thirtieth street			1
S. W.	Michigan avenue and South Water street	1		
N. E.	Michigan ave. and alley bet. So. Water st. and the river	1		
S. W.	Monroe street and Michigan avenue	1		
N. E.	Quincy street and Market street	1		
N. E.	Randolph street and Michigan avenue	1		
S. W.	Thirtieth street and Groveland Park avenue			1
N. W.	Twenty-first street and Dearborn street	1		
N. W.	Twenty-first st. and alley bet. Dearborn and State sts.	1		
N. W.	Wallace street and Thirty-sixth street			1
West	Side Butler street, 71 ft. south Twenty-fourth st.			1
North	Side Congress street, 100 ft. west Fifth avenue		1	
West	Side Calumet ave., 200 ft. south Thirty-first street			1
West	Side Calumet ave., 200 ft. south Thirty-second st			1
East	Side Clark street, bet. Fourteenth and Fifteenth sts.	1		
West	Side Calumet ave., bet. Thirty-third and Thirty-fifth sts	1		
North	Side Elgin st., bet. Stewart ave. and Purple st			1
West	Side Fifth ave., 390 feet north of Polk street	1		
West	Side Fifth ave., 408 feet south of Polk street	1		
West	Side Forest ave., bet. Thirty-third and Thirty-fifth sts.		1	
East	Side Fourth avenue, 265 ft. north of Harrison street. ...	1		
East	Side Grove st., bet. Stewart ave. and Twenty-sec'd st.			1
East	Side Grove st., between Nineteenth and Twentieth sts.		1	
East	Side Grove street, 170 feet south Stewart avenue			1
West	Side Iglehart place, 220 ft. north Twenty-eighth st.		1	
East	Side Michigan ave., bet. Lake st. and South Water st. ...	1		
West	Side McDermott st., 368 feet north of Archer avenue.			1
West	Side Portland avenue, 238 ft. south of Thirty-fifth st ..			1
East	Side S. Park ave., bet. Twenty-th'd and Twenty-fo'th sts	1		
South	Side Twenty-eighth st., 125 ft. east Cottage Grove ave		1	
S. W.	+ Calumet avenue and Thirty-second street		1	
N. W.	+ Calumet avenue and Thirty-third street	1		
S. E.	+ Calumet avenue and Thirty-first street ..	1		
Amount carried forward		19	8	17

SOUTH DIVISION.—CONTINUED.

CORNER	WHERE LOCATED.	Size of Hydrants.		
		4 Inch Double.	2½ Inch Double.	2½ Inch Single.
	Amount brought forward	19	8	17
N. E.	† Clark street and Sixteenth street	1		
N. E.	† Clark street and Seventeenth street	1		
N. W.	† Congress street and Michigan avenue	1		
S. W.	† Fifteenth st. and alley bet. State and Dearborn sts .		1	
N. E.	† Jackson street and Market street	1		
S. W.	† Michigan avenue and Randolph street	1		
N. W.	† Taylor street and Pacific avenue ..		1	
N. W.	† Thirty-second street and Forest avenue		1	
N. E.	† State street and Fourteenth street	1		
N. W.	† Twenty-seventh street and Johnson avenue		1	
East	State street, opposite Nineteenth street	1		
	Total for South Division	26	12	17
	Previously put in	130	259	561
	Totals	156	271	578
	Less by single hydrants taken out and renewed by 2½ and 4 inch double nozzle			14
	Grand Total for South Division	156	271	564

† Substituted for single hydrants.

WEST DIVISION.

CORNER	WHERE LOCATED.	Size of Hydrants.		
		4 inch Double.	2½ inch Double.	2½ inch Single.
N. E.	Canalport avenue and Morgan street.....	1		
S. E.	Canalport avenue and Brown street.....	1		
S. W.	Canal street and Fulton street.....	1		
N. W.	Central Park avenue and Twenty-fifth street.....			1
N. W.	Central Park avenue and Twenty-third street.....			1
N. W.	Central Park avenue and Twenty-fourth street.....			1
N. W.	Congress street and Laflin street.....			1
N. W.	Clinton street and School street.....	1		
S. W.	Clinton street and Monroe street.....	1		
S. W.	Desplaines street and Quincy street.....			1
N. W.	Elizabeth street and Randolph street.....	1		
N. W.	Fulton street and Jefferson street.....	1		
N. W.	Fulton street and Green street.....	1		
N. W.	Fulton street and Halsted street.....	1		
N. W.	Fulton street and Milwaukee avenue.....	1		
N. E.	Fourteenth street and Campbell avenue.....		1	
N. W.	Genesee avenue and Twenty-third street.....			1
N. W.	Genesee avenue and Twenty-fourth street.....			1
N. W.	Genesee avenue and Twenty-fifth street.....			1
N. W.	Harrison street and Clinton street.....	1		
N. W.	Holt street and Blackhawk street.....		1	
N. W.	Jackson street and Desplaines street.....	1		
N. E.	Jackson street and Jefferson street.....	1		
N. W.	Jackson street and Hamilton avenue.....			1
N. W.	Jackson street and Irving avenue.....			1
N. W.	Jackson street and Oakley avenue.....			1
N. W.	Jefferson street and Wayman street.....	1		
N. W.	Lincoln street and VanBuren street.....		1	
N. W.	Lumber street and Fourteenth street.....		1	
N. W.	Lumber street and Seward street.....	1		
N. W.	Lumber street and Stewart avenue.....	1		
N. E.	Nineteenth street and Loomis street.....		1	
N. W.	Nineteenth street and Throop street.....		1	
N. W.	Nineteenth street and Centre avenue.....			1
N. W.	Nineteenth street and Oakley avenue.....			1
N. E.	Nineteenth street and Western avenue.....			1
N. W.	Oakley avenue and Twentieth street.....			1
N. E.	Robey st. and alley bet. Madison st. and Warren ave.....			1
N. E.	Robey st. and alley bet. Lake st. and Park avenue.....			1
N. E.	Sixteenth street and Paulina street.....			1
N. E.	Twenty-second street and Bonney avenue.....			1
N. E.	Twenty-second street and Genesee avenue.....			1
N. E.	Washington street and Union street.....	1		
N. E.	Washington street and Elizabeth street.....		1	
N. E.	Washington street and Halsted street.....	1		
S. W.	Western avenue and Lake street.....	1		
S. W.	Western avenue and Madison street.....	1		
N. E.	Zion place and Loomis street.....			1
N. W.	Zion place and Throop street.....			1
West	Side Brown Street, opposite Eighteenth place.....		1	
West	Side Clinton street, 125 ft. south Randolph street.....	1		
Amount carried forward.....		21	8	22

WEST DIVISION—CONTINUED.

CORNER	WHERE LOCATED.	Size of Hydrants.		
		4 Inch Double.	2 1/2 Inch Double.	2 1/2 Inch Single.
	Amount brought forward	21	8	22
West	Side Central Park ave., 755 ft. south of Ogden ave.			1
West	Side Desplaines street, 210 ft. south of Monroe st.	1		
North	Side Eighteenth st. bet. Ashland ave. and Paulina st.		1	
West	Side Fleetwood st., 230 ft. north of Blackhawk st.		1	
North	Side Jackson street, 170 ft. east of Desplaines street.	1		
North	Side Jackson street, 320 ft. west of Desplaines street.	1		
West	Side Jefferson st. bet. Fulton st. and Lake st.	1		
West	Side Jefferson st. bet. Madison and Washington sts.	1		
West	Side Jefferson st. bet. Randolph and Washington sts.	1		
West	Side Jefferson st. bet. Randolph and Lake streets.	1		
North	Side Lake street bet. Wood street and Lincoln street.	1		
North	Side Lake street bet. Lincoln street and Robey street.			1
North	Side Lake street bet. Robey street and Hoyne ave.			1
North	Side Lake street bet. Oakley ave. and Western ave.		1	
West	Side Lumber street, 300 ft. north of Jefferson street.	1		
West	Side Lumber street, 600 ft. north of Jefferson street.	1		
West	Side Lumber street bet. Stewart avenue and Canal st.	1		
East	Side Lumber street, south of Eighteenth street.	1		
North	Side Meaghan street, 250 ft. east of Ashland ave.			1
North	Side North avenue, bet. McHenry and Fleetwood sts.		1	
North	Side Quincy street, 388 ft. west of Desplaines street.			1
North	Side Twenty-sixth street, 300 ft. west of Western ave.	1		
North	Side Twenty-sixth street, 784 ft. west of Western ave.	1		
N. E.*	Desplaines street and Harrison street.	1		
N. W.*	Desplaines street and VanBuren street.	1		
N. W.*	Fulton street and Peoria street.	1		
N. W.*	Jackson street and Loomis street.	1		
N. E.*	Jackson street and Clinton street.	1		
S. W.*	Jackson street and Centre avenue.	1		
N. E.*	Jefferson street and Washington street.	1		
N. W.*	Lake street and Wood street.	1		
N. W.*	Lake street and Leavitt street.	1		
N. E.*	Lake street and Robey street.	1		
N. E.*	Lake street and Hoyne avenue.	1		
N. W.*	Lake street and Oakley avenue.	1		
N. W.*	Lincoln street and Lake street.	1		
N. W.*	Lumber street and Canal street.	1		
N. W.*	Monroe street and Loomis.		1	
N. W.*	Robey street and Harrison street.	1		
N. W.*	Wood street and VanBuren street.	1		
	Total in West Division	51	13	27
	Previously put in	120	406	1067
	Totals	171	419	1094
	Less by single hydrants taken out and renewed by 2 1/2 and 4 inch double nozzle			17
	Grand totals for West Division.	171	419	1077

HYDRANTS.

NORTH DIVISION.

CORNER	WHERE LOCATED.	Size of Hydrants.		
		4 Inch Double.	2½ Inch Double.	2½ Inch Single.
N. W.	Clybourne avenue and street south of Clyde street....	1		
N. W.	Clybourne avenue and Wabansia avenue	1		
N. W.	Division street and alley east of Hickory street	1		
S. W.	Illinois street and Pine street	1		
N. W.	Lane Place and Centre street			1
S. W.	Lane Place and Sophia street			1
N. W.	Locust and Clark streets		1	
S. W.	St. Clair street and Illinois street	1		
S. E.	St. Clair street and Indiana street	1		
West	Side Clybourne ave. bet. Sheffield ave. and Concord pl.	1		
West	Side Clybourne ave. bet. Clyde st. and Wabansia ave..	1		
East	Side Lincoln ave. bet. Sophia street and Webster ave..		1	
East	Side Wesson street, 290 ft. north of Chicago avenue...	1		
West	Side Wesson street, 580 ft. north of Chicago avenue...	1		
East	Side Wesson street, 844 ft. north of Chicago avenue...	1		
N. E.	*Cass street and Ontario street	1		
N. W.	*Chicago avenue and Wesson street	1		
N. W.	*Clybourne avenue and Concord place	1		
N. W.	*Clybourne avenue and Sheffield place	1		
N. E.	*North avenue and Franklin street	1		
S. W.	*North avenue and Church street	1		
N. E.	*North avenue and Hurlbut street	1		
N. W.	*North avenue and Mohawk street	1		
N. W.	*North avenue and Orchard street	1		
N. E.	*North avenue and Sheffield avenue	1		
N. E.	*North avenue and Sedgwick street	1		
N. E.	*Rush street and Ontario street	1		
N. W.	*State street and Delaware place	1		
S. W.	*Smith street and North avenue	1		
N. E.	*Willow street and Sheffield avenue	1		
West	*Wesson street, 250 ft. south of Oak street	1		
Total for North Division		27	2	2
Previously put in		69	170	448
Totals		96	172	450
Less by single hydrants taken out and renewed by 2½ and 4 inch double nozzles				16
Grand totals for North Division		96	172	434

*Substituted for single hydrants.

RECAPITULATION.

DIVISION.	SIZE OF HYDRANTS.			TOTALS.
	4 Inch Double.	2½ Inch Double.	2½ Inch Single.	
South	156	271	564	991
West	171	419	1077	1667
North	96	172	435	703
Grand total in the city	423	862	2076	3361

In addition to the foregoing list of hydrants, there are five cisterns connected with street mains, as follows:

SOUTH DIVISION.

Intersection of Randolph street and Wabash avenue.
 " " Randolph street and State street.
 " " Washington street and State street.
 " " Michigan avenue and Madison street.
 " " State street and Madison street.
 " " Twelfth street and Michigan avenue.
 " " Thirty-fourth street and Cottage Grove avenue.

NORTH DIVISION.

Intersection of Oak and Sedgwick streets.
 " " North avenue and Larrabee street.

WEST DIVISION.

Intersection of Milwaukee avenue and Erie street.
 " " Halsted and Twelfth streets.
 " " Canalport avenue and Eighteenth streets.

PIPE TUNNELS.

UNDER THE RIVER.

HARRISON STREET.

The tunnel under the South Branch of the Chicago River at Harrison street was constructed for the purpose of conveying the 36-inch water main before referred to from the South to the West Division of the City.

The tunnel is built of brick, is elliptical in form, with a section of $9 \times 6\frac{1}{2}$ feet. The shafts are 9 feet in diameter. The east shaft extends to a depth of 71 feet below the surface of the ground. From the bottom of this shaft the tunnel is built nearly level for a distance of $264\frac{4}{10}$ feet; from this point it rises at an angle of 28 degrees for a distance of 53 feet, terminating at the bottom of the west shaft, which is 39 feet below the surface of the ground. The line of the tunnel lies north of the centre pier of Harrison street bridge.

The work was commenced May 11th last. In constructing the shafts the excavations were made in sections, and the bricks laid in like manner from the top down until the required depth was successfully reached. The shafts and tunnel were fully completed July 29 following, for the price named in the contract.

The ground through which the tunnel was built is hard blue clay. No trouble was experienced with water or otherwise; the work was therefore carried on to completion without difficulty or delay. The 36-inch water pipes were subsequently laid through the tunnel, and connected with the land pipes on each side of the river by stop valves placed near the tunnel shafts.

The river section of the pipe has been tested under water pressure, and the shafts properly covered, so that the entire work is now ready for use.

By permission of the department, the American District Telegraph Co. availed itself of the advantage of connecting its lines of wire by a cable passing through this tunnel.

CLYBOURNE PLACE.

The tunnel under the North Branch of the river at Clybourne Place was constructed for the purpose of conveying a 16-inch water main under the river at that point, and making connection with pipes of like size, which were laid on both sides of the river several years ago.

The work was commenced by the contractors, on the 19th day of June last. The first shaft was located on the west bank of river, at north side of street. The work of excavating and timbering was carried on to a depth of about 40 feet. The ground throughout the excavation was more or less wet, and when the depth referred to was reached, the quantity of water that accumulated was found to be beyond the capacity of the pump at hand to remove. At the request of the contractors, another site on the opposite side of the river was selected to recommence the work. This shaft was not timbered, but was bricked up as the excavation progressed, but after reaching even a less depth than that of the first shaft, the water was found fully as troublesome as before, and with no better facilities for pumping it out, the work could not be carried on. Finally after much delay, the contractors gave notice that they had abandoned the execution of the work as impracticable.

On the first of September following, this department commenced the work with skillful and experienced men, ample pumping capacity, and the necessary facilities to guard against failure. A brick shaft was sunk on west side of river, about fifty feet south of the first or abandoned shaft. The ground was found to be like that at the points abandoned; very wet and troublesome, requiring constant pumping. The progress of the work was therefore slow, although carried on without cessation day and night until the first day of November, when it was fully completed.

The tunnel is circular, six feet in diameter, built of bricks. The shafts are eight feet diameter. The west shaft extends 34 feet below the surface of the ground.

The tunnel is 220 feet long from west to east shafts. 180½ feet is constructed level, thence it rises at an angle of 16 degrees to the east shaft, which is 18 feet below the surface of the ground.

The top of shafts are covered with brick arches, sustained by I beams.

The 16 inch water main was laid through this tunnel immediately upon its completion, and connections made with land ends; since which time the pipe has been in use.

The following is a list of all the "pipe tunnels" under the river.

WATER PIPES UNDER THE CHICAGO RIVER.

LOCATION.	Size of Pipe.	BY WHAT MEANS.
Clybourne place.....	16 "	Through brick tunnel.
Division street.....	24 "	Through brick tunnel.
Chicago avenue.....	24 "	Through brick tunnel.
LaSalle street.....	36 "	Through general traffic tunnel.
Rush street.....	24 "	Through brick tunnel.
Adams street.....	12 "	Through brick tunnel.
Harrison street.....	36 "	Through brick tunnel.
Twelfth street.....	16 "	Iron pipe on river bottom.
Eighteenth street.....	24 "	Through tunnel formed through rock.
Main street.....	36 "	Through brick tunnel.
Archer avenue.....	16 and 12	Through brick tunnel.

THE LAKE TUNNELS

so far as known, remain intact. It is possible that the flow of water through the oldest or five feet tunnel, which has been in use about fourteen years, may be somewhat obstructed by deposit; of this however there is no reliable evidence.

In order to determine the question, it was thought best to pump the water out and make a personal examination of it between the shore and the crib. Preparations were made for the work, but the season had so far advanced, and the weather had become so severe, that it was deemed imprudent to proceed further; accordingly a suspension of the work was ordered until a more suitable time of the year.

Of the seven feet tunnel, there is not even a suspicion of its requiring any examination or repairs.

THE CRIB

has thus far during the present winter been subjected to as severe a test as at any period since it was built. For weeks in succession the lake in this vicinity has been covered with unusually heavy ice, so that much of the time no water was visible on the surface with a powerful glass.

Persons on foot, and with horse and sleigh, have passed over the ice to and from the crib, and supplies have been carted out. Visits to the crib over the ice have been made on several occasions in the past, but the thickness and continuation of the ice this season are believed to be beyond anything of the kind experienced for many years.

The movement of this vast field of ice around the crib, sometimes at a velocity of four to six miles an hour, has frequently threatened the water supply, but by the efforts of the crew stationed at the crib, aided by the steam tug, which at times was indispensable, the openings have been kept sufficiently clear, so that the supply of water to the city has not been interrupted.

The steam tug engaged for winter service has been obliged to lie at the crib day and night for some time; not in actual service, but owing to the fact of not being able to make the harbor, on account of the ice. Some repairs referred to in last report are needed to the walls of the crib, which will probably be made during the ensuing year.

A cupola is being constructed for the light-house on the crib, and will be put up as early as possible, so as to be ready for use at the opening of navigation.

FULLERTON AVENUE CONDUIT.

These works have been in operation most of the time during the year.

The time for which the contractors were to operate the engines, expired on the 9th day of January of the present year. By the terms of the contract, the engines were required to develop an effective duty of "seventy million foot pounds per one hundred pounds of coal consumed." A test trial of twenty-four hours duration of each engine was commenced on the twenty-third day of December last, which resulted in a full compliance with the requirements of the contract; the machinery was accordingly accepted by the City.

An extended description of these works, with illustrations, was given in the last annual report.

Up to the close of the year the lake work was in good condition, some repairs, however, will probably be needed the coming year, to meet the effects of the moving fields of ice, to which the wood-work has been exposed.

The conduit proper is believed to be in good order.

The machinery at the river end is also in working order, although the brick-work surrounding the boilers has settled considerably, and will probably have to be partially rebuilt.

A book was furnished by the city early in the year, in which to keep a daily record of the operations of the machinery and conduit, but owing to the neglect of those in charge, the record, when presented at the close of the year, was found to be so deficient and unreliable, that a detailed statement of the performance of the machinery and conduit cannot be reported.

The condition of the lake in the vicinity where the water is delivered from the conduit was examined several times during the past summer. The locality was reached by steam tug, carrying his Honor the Mayor, Commissioner of Public Works, Commissioner of Health, members of the press, engineers and others. The examinations extended over a large area of the lake, reaching in a south-easterly direction beyond the water supply crib. The lake was discolored by the water from the conduit for a distance of less than one-fourth of a mile from point of delivery. No trace of river water was noticed between this point and the "lake crib," a distance of over two miles.

The result of these investigations has established the opinion that the water delivered from the conduit into the lake does not flow south-east in the direction of the water supply crib, but that the bulk of it is carried north-east. Occasionally, however, a portion of the water from the conduit is found close along the shore, a short distance south of the point of delivery.

No offense arises from this condition, except in cases of continued calms of the lake, which are not of frequent occurrence.

If at points further south the current in the lake sets in the same direction as stated above, viz.: towards the north-east, then the course of the water flowing from the river into the lake would at least be in the direction of the "crib," although it may not reach that point. It appears, therefore, that the possibility of the water from the main branch of the river reaching the city water supply is greater than it is from the water from the Fullerton Avenue conduit.

WATER METERS.

The following is a list of meters reported in use up to close of the year; also the number added and removed during the year.

Size of Meters.	$\frac{5}{8}$	$\frac{3}{4}$	1	$1\frac{1}{2}$	2	3	4	Total.
Number reported in use Dec. 31, 1879	649	87	820	190	109	207	5	2,067
Number set during year 1880.....	24	6	41	23	17	24	0	135
Whole number.....	673	93	861	213	126	231	5	2,202
Number removed during year 1880.	28	1	39	8	5	7	1	89
Total number in use Dec. 31, 1880 ..	645	92	822	205	121	224	4	2,113
Meters in use owned by City	459	62	718	172	101	176	3	1,691
Meters in use owned by private parties	186	30	104	33	20	48	1	422
Total.....	645	92	822	205	121	224	4	2,113
Number of meters purchased from manufacturers.....	4	6	4	16	8	17	0	55
Number purchased from private parties.....	19	3	10	4	4	7	0	47
Total.....	23	9	14	20	12	24	0	102
On hand Dec. 31, 1880.....	27	4	12	5	0	5	3	56

All water meters and their attachments, together with the iron or lead service pipes leading to them from the city mains, also all cast iron pipes leading from the same point, with the valves and other appurtenances for the supply of hydraulic en-

gines, operating elevators, or supplying water to buildings, are put in at the expense of the owners or occupants thereof, and therefore belong entirely to them.

All such pipes, etc., must be kept in good repair, and be protected from damage by frost, or otherwise, by said owners or occupants. The City puts in the proper valves, etc., for elevator supply, and furnishes the water under certain conditions and restrictions, but is in no manner responsible for any accident or damage that may occur by the bursting of pipes or any attachments thereto, on account of frost or otherwise.

In view of possible damage that may occur from the bursting of large pipes which are exposed to frost, it is important that they should be carefully and properly protected. Such work should be done each season early in November. Upon application, this department will furnish men for the purpose.

HYDRAULIC ENGINES FOR ELEVATOR PURPOSES.

The number of these engines put in during the past year is double that of the previous year.

The number in use December 31, 1879, was.....	173
The number added during 1880, is	57

Total number in use December 31, 1880.....	230
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The total revenue collected during 1880 for water measured by meters and used for elevator purposes is \$271,159.76, being \$26,540.21 in excess of the amount collected from like sources during 1879.

The following table is appended showing the meter rate in various cities in the United States, per thousand gallons:

Boston, Mass.....	30 cents.
Burlington.....	40 "
Burlington.....	50 "
Binghampton.....	25 "
Cambridge, Mass.....	30 "
Cincinnati, Ohio.....	15 "
Columbus, Ohio.....	20 "

Danvers.....	20 cents.
Evansville	20 "
Fall River, Mass.....	30 "
Grand Rapids, Mich.....	30 "
Hartford, Conn.....	30 "
Holyoke, Mass	15 "
Johnstown.....	25 "
Kalamazoo, Mich	30 "
Lynn, Mass	25 "
Lawrence, Mass.....	30 "
Louisville, Ky.....	15 "
Lowell, Mass.....	20 "
Morristown	40 "
Manchester, N. H.....	30 "
Marshalltown, Iowa	40 "
Newport.....	35 "
New Albany.....	15 "
Newark, N. J.....	13 "
Ottumwa	30 "
Portland, Me.....	50 "
Pawtucket, R. I	30 "
Providence, R. I.....	30 "
Rochester, N. Y.....	25 "
Schenectady, N. Y	50 "
St. Paul, Minn.....	50 "
Syracuse, N. Y.....	40 "
Taunton, Mass.....	25 "
Titusville.....	30 "
Toronto, Ca.....	27 "
Utica, N. Y.....	30 "
Worcester, Mass	25 "
Waterbury, Conn	30 "
CHICAGO, ILL.....	8 "

Average of the above forty cities about 29 cents.

RIVER.

The water of the Main and North Branches of the river has continued in good condition throughout the year.

The character of the water of the principal portion of the South Branch, although not so desirable as the balance of river, has at no time been unduly offensive.

The stage of water in the river has ranged from $\frac{3}{10}$ feet below the plane of City datum to $3\frac{3}{10}$ feet above.

The lowest mean stage of water for a month was in March last, being $\frac{3.3}{100}$ feet above City datum.

The highest was in August, being $2\frac{17}{100}$ feet above City datum.

The mean elevation for the year being 1.246 feet above.

With the exception of a few days at the opening of navigation, there has been no obstruction to the movements of vessels in the river on account of low water.

During the year estimates have been made for dredging and straightening the river at Eighteenth street, also between Adams and Jackson streets, and at Erie street.

The following table is appended, showing the stage of water in the river for each month during the year:

ELEVATION OF WATER IN CHICAGO RIVER, 1880.

MONTH.	HIGHEST.	LOWEST.	MEAN.	Number of days above mean.
January	1.40	—0.10	.77	14
February	1.40	0.00	.57	9
March	1.40	0.20	.33	26
April	1.90	— .30	.79	10
May	2.00	.60	1.21	13
June	3.30	1.20	1.80	14
July	2.60	1.10	2.02	13
August	2.80	1.70	2.17	12
September	2.60	1.10	1.79	10
October	2.10	0.00	1.46	17
November	1.90	0.50	1.14	13
December	1.50	0.20	0.91	13
Average	2.075	0.55	1.246	164

DREDGING.

There has been no dredging done by the City during the year, although some has been done on private account in the branches of the river, notably in the south and west forks of the South Branch.

Soundings have been made at all the bridges and at other points on the river, and the results platted for future reference.

DOCKS.

The docks have been rebuilt at the foot of Carroll avenue and North Market street, and repairs made on dock foot of North Dearborn street.

The expense of this work is provided for by the revenue derived from rent of street ends.

The construction of new docks by private parties has been quite extensive, principally in the slips and on the north line of the west fork of the river, also along the south fork in the vicinity of the rolling mills. These improvements have been made on the line of the west fork of the river as far west as Western avenue, a locality where there is plenty of room and ample railroad facilities to meet the demands of the rapidly extending lumber district.

SOUTH BRANCH PUMPING WORKS.

It may be of interest to make a brief record of the action on the part of the City towards the establishment of the proposed pumping works at the canal and South Branch, for the purpose of abating the nuisance alleged to arise from the sewage of Chicago.

March 29th, 1880, the Council appropriated \$100,000 for the work.

Specifications were framed and sent throughout the United States, England and Canada, and advertised in newspapers, inviting proposals for the construction of machinery to deliver into the canal 60,000 cubic feet of water per minute.

The bids were opened October 18th, 1880, ranging in price from \$125,000 to \$275,000 for the machinery alone, independent of the cost of the canal lock, machinery foundations, building, construction of delivery channel, etc., which would cost about \$50,000. There being but \$100,000 to meet these demands, no further steps could be taken in the matter until a sufficient sum was provided for the work.

You are familiar with the various meetings of residents on the line of the canal, the conference of the City authorities and the Canal Commissioners, and the action of the State Legislature upon the subject; therefore further reference to the subject at this time is unnecessary.

OUTER HARBOR.

Major G. J. Lydecker, Engineer, U. S. A., has kindly furnished the following synopsis of the work executed under his directions, for the year ending December 31, 1880:

"The total expenditure by the General Government during this period (1880), was \$47,708.26. It was applied to completing the southern breakwater, which shelters the outer harbor from south-easterly storms, and to dredging the harbor, in part, to a depth of 16 feet at mean low water.

"The work of breakwater construction consisted in building and sinking in position seven cribs, each 100 feet long, $14\frac{1}{2}$ feet high and 16 feet wide; four cribs which were sunk during the preceding year, and which had settled out of line and level, were leveled up to the water line; a superstructure 6 feet high was built on these cribs and on the seven new cribs. The total length of superstructure placed during the year being 1,100 feet. This breakwater is now finished, the total length being 3,000 feet.

"Dredging was not commenced until late in the fall, and owing to unfavorable weather, but little progress was made before the contractors were compelled to suspend operations for the winter; up to date of suspension 15,182 cubic yards had been excavated.

"In addition to the above, some few repairs were made to the North Pier.

"During the current year dredging will be continued in the outer harbor, and the construction of a detached breakwater to

the northward of the present entrance to the river will be commenced. This breakwater is designed to facilitate the entrance of vessels to the interior harbor during heavy northerly storms, and to afford a harbor of refuge, where vessels may safely ride at anchor.

"For the objects above indicated it is proposed to expend in the neighborhood of \$250,000 during the coming year."

BRIDGES.

The following is a list of bridges over the Main River and the branches:

TABULAR STATEMENT OF SWING BRIDGES AND GRADES ON APPROACHES TO BRIDGES.

MAIN BRANCH.

LOCATION.	LENGTH.	WIDTH.	MATERIAL OF SUPERSTRUCTURE.	When Erected.	MATERIAL OF SUBSTRUCTURE.	When Erected.	APPROACHES.		
							LOCATION.	LENGTH IN FEET.	GRADIENT.
Rush street.....	211	33	Iron	1872	Stone	1872	Mich. ave., River street North State	126 232 184	1 foot in 27.4 " " 63. " " 25.3
*State street	184	36	Iron	1872	Stone	1872	South	167	" " 28.
*Clark street.....	180	37½	Combination.....	1872	Stone	1872	South	184	" " 32.
*Wells street.....	190	35½	Iron	1872	Stone	1872	South	132	" " 23.

SOUTH BRANCH.

Lake street.....	185	33	Combination	1868	Piles.....	1859	East	177	1 foot in 28.78
*Randolph street.....	157	34	Iron	1874	Piles.....	1864	East	235	" " 37.3
*Madison street	157	31½	Iron	1875	Stone	1857	East	338	" " 48.9
Adams street.....	160	32	Iron	1872	Stone	1872	East	278	" " 27.33
*Van Buren street.....	163	34	Combination	1872	Stone	1872	East	168	" " 31.46
Harrison street.....	175	31	Iron	1872	Piles.....	1877	West	113.5	" " 42.8
Polk street.....	154	31	Iron	1872	Stone	1872	East	194	" " 34.64
Twelfth street.....	202	32½	Combination	1868	Piles.....	1872	West	385	" " 60.53
Eighteenth street.....	175	32	Combination	1868	Piles.....	1868	East	212	" " 26.4
Twenty-second street.....	210	32	Combination	1871	Piles.....	1871	West	250	" " 38.22
†Archer avenue, Ogden Slip.....	115	40	Combination	1871	Piles.....	1871	East	184	" " 24.5
*South Halsted street.....	150	31½	Iron	1872	Piles.....	1871	West	240	" " 28.4
Main street.....	152	29	Combination	1868	Piles.....	1868	.....	202	" " 18.58

SOUTH FORK OF SOUTH BRANCH.

Fuller street.....	127	194	Combination ...	1877	Piles.....	1865	.....	.....
Archer avenue.....	152	283	Combination ...	1870	Piles.....	1870	.....	.....
Douglas place.....	141½	21½	Combination ...	1874	Piles.....	1874	.....	.....

WEST FORK OF SOUTH BRANCH.

Ashland avenue.....	152	18½	Wood.....	1871	Piles.....	1871	.....	.....
Western avenue.....	125	21½	Combination ...	1869	Piles.....	1869	.....	.....

NORTH BRANCH.

Kinzie street.....	170	31½	Combination ...	1870	Piles.....	1870	East.....	50	1 foot in 26.8
Indiana street.....	163	32	Combination ...	1869	Piles.....	1869	West.....	88	1 " " 21.5
Érie street.....	200	32	Combination ...	1871	Piles.....	1871	East.....	283	1 " " 27.61
Chicago avenue.....	175	32½	Combination ...	1872	Stone.....	1872	East.....	253	1 " " 20.69
North Halsted and River.....	140	20	Combination ...	1877	Piles.....	1866	West.....	245	1 " " 41.66
North Halsted and Canal.....	228	32	Iron.....	1874	Piles.....	1874	South.....	221	1 " " 28.7
Division and River.....	180	29	Combination ...	1869	Piles.....	1869	North.....	109	1 " " 5.45
Division and Canal.....	176	....	Combination ...	1870	Piles.....	1870	.....	.....	Level with bridge.
North avenue.....	150	29	Combination ...	1877	Piles.....	1865	.....	.....	" " " "
Clybourne place.....	140	32	Combination ...	1873	Piles.....	1873	East.....	.....	1 foot in 54.65
Fullerton avenue.....	125	20	Combination ...	1877	Piles.....	1875	West.....	135	Level with bridge.
Total.....	5,464½	964½	.....	.....	.....	.....	.....	.....	" " " "
Average.....	165.59	29.23	.....	.....	.....	.....	.....	.....	.....

*Crossed by street railways. *Crossed by street railways and C. & A. R. R.

To properly maintain in good repair so large a number of bridges requires the constant attention of a large gang of workmen, and involves a large annual expenditure of money. The cost of maintaining this branch of the public service will naturally increase as new bridges are added, and in proportion to the rapidly increasing travel over them. Most of the bridges are in fair condition, some of them, however, require extensive repairs, and others need replacing with new structures, in order to render them reliable.

The stone work of the centre pier of Wells street bridge is badly cracked and otherwise defective.

The centre pier of Fullerton avenue bridge is a cluster of piles, which are already out of shape, so much so as to require renewing.

The west approach of Randolph street bridge is a trestle work of wood, the main portion of which is badly decayed.

Owing to the limited space for the passage of vessels, the protections to the bridges are subjected to very rough usage, on account of frequent collisions. Most of these structures are, therefore, in a dilapidated condition. Taking advantage of the facilities offered by the heavy ice in the river for making repairs on the protections, the work will be carried forward as far as possible before the opening of navigation.

During the past year several small bridges have been erected.

A wooden bridge, designed by the City to replace the old bridge at Lock street and the canal, was, upon request of the Canal Commissioners, located over the canal at Ashland avenue, the State paying the extra expense of the transfer.

In January last a foot-bridge was placed over the south entrance to La Salle street tunnel, for the convenience of those doing business in that immediate vicinity.

MADISON STREET BRIDGE.

The east and west abutments of Madison street bridge were found to be in a dangerous condition, owing to the pressure of earth having forced them out of plumb towards the river. Both

of the abutments were razed to near the level of river, and rebuilt with new stone. Heavy retaining walls of stone were built parallel to and ten feet back of the abutments, with foundations eight feet below the surface of river. The space between abutment and retaining walls was spanned with I beams and brick arches, the whole forming a very substantial work, and relieving the bridge abutments from the pressure of the earth.

Temporary structures were put up and the main bridge partly swung for foot passengers to pass during the progress of the work, but the passage of the street cars and all other traffic was for the time necessarily suspended. The rebuilding was commenced February 20th, and in consideration of the importance of the thoroughfare, and the convenience of the public, the work was carried on day and night without cessation until completed, and opened to travel on the 23d of March. During this time 735 cubic yards of stone masonry were put in.

The work was done by men employed by the city, and under the immediate supervision of this Department.

EIGHTEENTH STREET BRIDGE.

In August last Eighteenth street bridge was examined and found to be in a dangerous condition. The lower chords were strengthened and other repairs made, so that it is now in much better condition, but by no means as reliable a structure as is demanded at this point.

STATE STREET BRIDGE.

The new turn-table for State street bridge, referred to in last report, was put in place and the bridge swung for travel.

During the progress of this work it was discovered that the pins in the chords connecting the diagonal braces were badly bent, and unfit for the service required of them. The bridge was again ordered closed to travel until the faulty parts could be repaired, which was done by substituting steel pins in place of the defective iron ones, and the bridge again put in service. During the work of placing the new turn-table, the North Divis-

ion Railway Company laid tracks over the bridge to connect with its new line on North State street. This special traffic and the increasing general traffic over this bridge is such as to warrant the early construction of a stronger and more reliable structure at this crossing of the river.

If a new bridge is erected at State street, it is proposed to rebuild the present bridge and remove it to Eighteenth street, in place of the combination bridge now at the latter place.

VIADUCTS.

Most of these structures are in fair condition at present. The repairs made during the past year being only such as were absolutely necessary for the safety and convenience of the public.

The principal expenditure has been for renewing the floors, which was about all that could be done and keep within the limits of the amount appropriated for the maintenance of viaducts.

The custom of merely keeping the viaducts and bridges in a passable condition, does not appear to be the course of true economy. In addition to repairs of these structure arising from ordinary wear, their preservation from the elements should receive a due share of attention.

Probably the best means for the protection of the bridges and viaducts against corrosion and decay, due to natural and local causes, is to thoroughly clean the surfaces and cover them with paint composed of the best and purest material that can be procured for the purpose; adding a new coat of like material each and every year thereafter, thus forming an armor that will go far to preserve the structures from rapid deterioration.

SOUTH HALSTED STREET VIADUCT

is of iron, with stone substructure; was built in 1869 over the tracks of the C., B. & Q. and N.-W. railway companies.

It consists of two spans having double roadways, each $88\frac{1}{2}$ feet in length.

There is no record showing that this viaduct has received any care, in the way of cleaning or painting, since it was erected. The consequence is, the lower chords and the connections thereto are so badly corroded as to greatly impair the strength of the structure and render it positively unsafe for use.

The cars of the West Division Railway Company cross this viaduct, and it is otherwise an important point of travel. In view of this and its dangerous condition, the passing of cars and teaming was stopped for a time during November, until the structure could be strengthened by placing wooden girders under it, supported by timbers from the ground. It remains in this condition pending an appropriation for its reconstruction, or an entirely new viaduct.

CANAL AND SIXTEENTH STREET VIADUCT

was built in 1869. The floor beams are far too light, rendering it necessary to replace them with heavier ones. This work should be done at an early day. It is believed this structure has not been painted since it was erected, and therefore needs attention in this particular. These repairs will place this viaduct in good condition.

STATE STREET VIADUCT

needs precisely the same repairs as those required on Sixteenth street last referred to, and also requires new pins for the connection of the diagonal braces.

ERIE STREET VIADUCT.

This structure is of wood resting on stone piers and abutments.

It is composed of three spans, having an aggregate length of 460½ feet, over the tracks of the C. & N.-W Railway Company.

During the past year the principal parts of this viaduct were found to be badly decayed. It is regarded beyond repair, and should therefore be replaced by an entire new superstructure of iron, the estimated cost of which is \$26,000.

MADISON STREET VIADUCT.

A portion of the west abutment of this viaduct has been cut away a few feet, and the south truss of the superstructure moved a like distance west. Proper piers were built and a portion of the floor system rebuilt, so that the structure is in much better condition than before. During the progress of this work travel was but slightly impeded.

The change was made by permission of the Department, but the work was done and the cost of same paid by the Pennsylvania Railway Company.

ADAMS STREET VIADUCT.

The floor system of this structure has been entirely rebuilt, at a cost of \$2,537.00. The slender iron beams have been replaced with heavy wooden girders, and a new floor laid, a portion of which was covered with the ordinary wood-block paving, and is found to be a vast improvement, in point of wear, over a plank floor.

In the extensive improvements made by the Pennsylvania Railway Company in the immediate vicinity of this viaduct, it was found necessary to shorten the west span about fifteen feet, and build a new stone abutment for the purpose of carrying the main tracks of the company clear of supporting columns.

No change was made in the grade of the approaches or viaduct.

The work was carried on and completed with but little or no inconvenience to the public travel, and wholly at the expense of the railway company.

VAN BUREN STREET VIADUCT.

The original viaduct over the tracks of the Pennsylvania Railway at this point was of iron, 32 feet span; built in 1870. It was examined in the early part of the year and found to be in a condition necessitating extensive repairs, which the City was relieved from making owing to the subsequent action of the railway company, which requiring more space for track, gave

notice that it would immediately build new stone abutments, and erect thereon a new double roadway viaduct of iron, with a span of about double the old one. This work was duly completed, and a portion of the street between the viaduct and Charles street repaved. The whole constituting a substantial and much needed improvement without any cost whatever to the City.

MILWAUKEE AVENUE AND DESPLAINES STREET VIADUCT.

This is a double viaduct of iron, connecting at the intersection of the streets.

The branch on Milwaukee avenue is 680 feet long and 59 feet wide.

That on Desplaines street, 472 feet long and 65 feet wide, making a combined length of 1,152 feet, being by far the longest viaduct in the city.

This viaduct was erected in 1876. At that time a portion of both branches of the structure not over railroad tracks, was temporarily constructed of trestle-work to meet a contemplated requirement of the railway company.

During the past year the tracks have been extended and the sections of trestle-work have been replaced with stone piers and iron girders, according to plans furnished by the Department.

The addition on Milwaukee avenue is $173\frac{1}{2}$ feet, in three nearly equal spans. That on Desplaines street is 125 feet, in three spans.

The work was commenced May 24th, and completed October 6th. The cost of this addition was \$27,365.00, which was paid by the Milwaukee & St. Paul Railway Company.

The total cost of the entire viaduct was \$296,043.00, of which the railway companies have paid \$131,878.00.

The structure as a whole is very substantial and spacious.

SANGAMON STREET VIADUCT

is a new structure of a very substantial character now in course of erection, composed of five spans of 36, 172 $\frac{1}{4}$, 99 $\frac{3}{4}$, 98 $\frac{1}{2}$ and 52 feet long, respectively, extending from Kinzie street south to Carroll avenue. The structure is 38 feet over all, with a roadway 18 feet in the clear. The estimated cost of the viaduct, complete, is \$86,000.00. Of this amount the railway companies interested pay \$57,000.00, and the City the balance, viz: \$29,000.00.

This work has so far progressed that we may look for its completion for traffic about the middle of May next.

The quality of the iron of which this viaduct is being constructed, was tested by the Department before being accepted, and was found to comply with the requirements of the specifications. Like tests will be made with the iron for Harrison street viaduct.

DETAIL OF SPANS FOR SANGAMON STREET VIADUCT.

Length of Trusses.	Height of Trusses.	Width of Bridge.	Weight per lineal foot of two Trusses with their Bracing.	Weight of Iron in Floor per foot of length.	Weight of Wood Floor, Sidewalks, Railings, Etc., per foot.	Total Weight per lineal foot.	REMARKS.
Feet.	Feet.	Feet.	Lbs.	Lbs.	Lbs.	Lbs.	
52	7 $\frac{1}{2}$	38	275	501	650	1,426	Pin Connection Trusses.
98 $\frac{1}{2}$	16	38	630	560	650	1,840	" " "
99 $\frac{3}{4}$	16	38	630	560	650	1,840	" " "
172 $\frac{1}{4}$	24	38	1,115	560	650	2,325	" " "
36	2 and 2 $\frac{1}{2}$	44	518	456	750	1,724	5 Plate Girders and Floor.

The structure is designed to carry a moving load of 3,000 lbs. per lineal foot distributed over roadway and sidewalks, and the floor system of roadway to carry a concentrated moving load of 25,000 lbs. on one wagon; permissible strain under these loads not to exceed 10,000 lbs per square inch in main tension mem-

bers, 9,000 lbs. in counter braces and 6,000 lbs. in suspenders and members liable to sudden shocks.

HARRISON STREET VIADUCT.

This is a proposed new iron structure under contract, to consist of four spans, two of 132 feet each, one of 154 feet and one of 80 feet in length. The roadway is 18 feet in the clear, and the structure 38 feet over all. The roadway will be laid with wooden-block pavement.

The contract for this work was let too late in the season to make much progress before winter. It is expected, however, that the viaduct will be completed and open for travel by mid-summer.

The estimated cost of masonry, filling, paving, raising buildings to grade, is.....	\$47,000 00
The contract for superstructure amounts to.....	60,000 00

Total	\$107,000 00
Of this amount the City will pay about.....	29,000 00
The railway companies.....	78,000 00

In the original plan of this viaduct the west approach terminated at the east line of Canal street. The railway companies have made changes which require a longer viaduct, extending the west approach to a point between Canal and Clinton streets, and necessitates side or wing approaches on Canal street, thus involving a large extra expense. The cost, however, beyond the amount originally appropriated for this work, is to be paid by the railway companies interested.

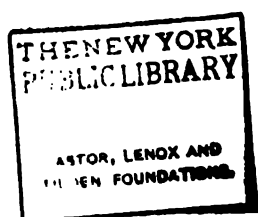
The two viaducts last referred to are illustrated on the following pages.

DETAIL OF SPANS FOR HARRISON STREET VIADUCT.

Length of Trusses.	Height of Trusses.	Weight per lin'l foot of two Trusses with the Bracing.	Weight of Iron in Floor System per foot of length.	Weight of Floor Paving per lin'l foot.	Total Weight of Span per lin'l foot.	
Feet.	Feet.	Lbs.	Lbs.	Lbs.	Lbs.	
154	20	1,400	760	980	3,120	Pin Connection Truss.
133	20	1,000	700	980	2,680	" " "
80	6	750	600	980	2,330	Plate Girder.

The structure is designed to carry a moving load 3,200 lbs. per lineal foot on both roadway and sidewalks, and for the floor system an additional concentrated load of 30,000 lbs.; permissible strain under this load, 9,000 lbs. per square inch in main tension members; counter braces, 8,000 lbs. per square inch; suspenders, 6,000 lbs. per square inch. Compression members, Gordon's formula with factor of 5.

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TABULAR STATEMENT OF FIXED SPANS AND VIADUCTS, WITH
GRADES OF APPROACHES.

LOCATION.	Feet in Length.	Feet in Width.	Material of Construction.	When Built.	APPROACHES.		
					Location.	Length in Feet.	Gradient.
Halsted and Sixteenth sts.	176½	60	Iron....	1869	North....	410	1 foot in 31.
Van Buren street.....	65	62	Iron....	1880	South....	265	1 " " 21.
Adams street.....	306	33½	Iron....	1869	East....	184	1 " " 26.7
Madison street.....	83	59	Iron....	1866	West....	176	1 " " 23.
Randolph street.....	81	60	Iron....	1871	West....	200	1 " " 18.4
Lake street.....	78¾	60	Iron....	1872	West....	221	1 " " 31.7
Lake st. app'h to river b'dge	91	.....	Iron....	1872	West....	268	1 " " 70.
Wells street.....	83	80	Iron....	1872	West....	176	1 " " 21.5
Clark street.....	83	80	Iron....	1872	North....	230	1 " " 27.5
State street.....	304	59	Iron....	1872	North....	278.5	1 " " 37.5
Erie street.....	467	34	Wood..	1871	North....	270	1 " " 36.
Indiana street.....	614	31¾	Wood..	1869	West....	350	1 " " 26.
Canal and Sixteenth sts.	300	64	Iron....	1873	West....	228	1 " " 24.
Halsted and Kinzie streets	473	62	Iron....	1874	North....	550	1 " " 42.5
Twelfth and Beach streets.	58	58	Iron....	1873	South....	530	1 " " 39.5
Blue Island avenue.....	122	65½	Iron....	1876	North....	524	1 " " 38.5
Throop street.....	101	55½	Iron....	1876	South....	472	1 " " 39.
Milwaukee avenue.....	680	59	Iron..	1876	East....	378.5	1 " " 30.
Desplaines street.....	472	65	Iron..	1880	West....	408	1 " " 32.
Eighteenth street.....	184	36	Iron....	1879	South....	570	1 " " 39.
Kedzie avenue, over Canal	108	20	Iron....	1880	North....	507	1 " " 37.
Kedzie avenue, over River	100	18	Wood..	.....	North....	423	1 " " 31.
Western ave., over Canal.	108	20	Wood..	.....	South....	433.5	1 " " 30.
Ashland ave., over Canal.	106	20	Wood..	.....	N. W. ....	.....	1 " " 50.
Sangamon street.....	458	38	Iron....	1880	S. E. ....	.....	1 " " 40.
Harrison street.....	498½	38	Iron....	1880	Both ways.	.....	1 " " 40.
La Salle street, over south approach to tunnel.....	19	5	Iron....	1880	West....	130 } 460	1 " " 40.5
					West....	330 }	1 " " 28.
Total united length. 5,222 5-12							

A needed improvement in connection with the bridges and viaducts is that of lighting them at night. Many are but poorly provided for in this particular; this is especially true of the approaches to the bridges.

The importance of properly arranged and ample light at the latter points when a bridge is swung at night, is essential to safety and convenience.

PROPOSED NEW BRIDGES AND VIADUCTS.

The following is a list of bridges and viaducts which have been proposed and considered by the City Council; also the estimated aggregate cost of same:

Swing Bridges.	River.	Viaducts.	Railroad Companies.
Jackson st.	So. Branch	Chic. ave. & Halsted st.	C. & N. W. R'y
Fourteenth st.	" "	Halsted & Sixteenth sts	C. & N.W. & C., B. & Q. Rys
Taylor street	" "	Center Avenue.....	" "
Eighteenth st.	" "	Twelfth street.....	M. S. & L. S. & R. I. Rds.
Lake street.	" "	Erie street.....	C. & N. W. R'y.....
Dearborn st.	Main River	.....	.....
State street.	" "	.....	.....

The estimated total cost of the above improvements, including the portion to be paid by the various railway companies, and land damages, will be about one million five hundred thousand dollars.

SEWERAGE.

This branch of the public work was under my charge until the close of the first quarter of the year, at that time, by consent of his Honor the Mayor and the Commissioner, Mr. G. H. Ellers was assigned to the position of Superintendent of Sewers, and has since been in charge of the work. The Superintendent will probably make report to you under this head, for the entire year.

Permit me to acknowledge the continued courtesy and official coöperation of the Commissioner in all matters under my charge; also the kindly consideration of other officers of the Department with whom I have been officially associated, and to bear testimony to the faithfulness and industry of those directly connected with the "Engineer's Department."

Respectfully submitted,

DEWITT C. CREGIER,

City Engineer.

SEWERAGE DEPARTMENT.

CHICAGO, 1st January, 1881.

MR. CHARLES S. WALLER,

Commissioner of Public Works, Etc.

SIR: I have the honor to transmit herewith a report of the operations of the "Sewerage Department" for the year ended the 31st day of December, 1880, at which date the condition and extent of the general drainage system of the City of Chicago is shown by the following tabulated statement:

DIAMETERS OF SEWERS IN FEET AND INCHES.

WARDS.	9 FEET.	6 1/2 FEET.	6 FEET.	5 1/2 FEET.	5 FEET.	4 1/2 FEET.	4 FEET.	3 1/2 FEET.	3 1/4 FEET.	3 FEET.	2 3/4 FEET.	2 1/2 FEET.	2 FEET.	20 Inches.	18 Inches.	15 Inches.	12 Inches.	TOTAL LINEAR FEET.
1							1,926	.....	.....	8,470	12,960	4,286	13,135	.....	.....	1,870	46,652	89,299
2										5,260	6,965	2,073	11,036	.....	.....	.....	28,974	54,802
3			1,480	.....	4,008	.....	656	.....	.....	1,485	16,095	.....	20,340	.....	.....	.....	27,476	73,023
4			704	.....	1,058	1,261	1,745	916	.....	4,685	29,185	.....	41,030	.....	4,054	5,082	44,244	133,964
5					6,697	5,767	7,000	1,938	.....	13,895	10,549	.....	50,038	1,625	4,518	9,274	43,391	184,712
6	1,559	1,380	1,972	4,114	3,303	9,450	10,355	4,136	.....	3,193	3,855	.....	24,525	.....	.....	11,590	32,126	111,558
7					5,845	1,919	7,788	3,598	.....	5,973	3,220	.....	28,865	.....	.....	12,205	41,417	110,830
8					9,305	10,675	6,320	.....	.....	1,175	630	.....	37,445	.....	.....	.....	35,186	100,736
9					9,027	4,198	.....	.....	.....	.....	.....	.....	24,475	.....	.....	.....	25,038	62,738
10			1,296	.....	6,648	3,911	3,375	.....	.....	.....	.....	.....	28,810	.....	.....	.....	18,388	62,428
11						19,019	3,684	.....	.....	705	630	.....	31,428	.....	.....	1,670	34,154	91,290
12							14,686	9,450	.....	8,315	6,368	.....	42,327	.....	.....	6,350	43,048	131,564
13							11,650	5,189	332	4,623	990	.....	17,875	.....	.....	3,375	33,903	77,937
14			3,006	1,346	12,617	9,384	8,368	516	333	5,230	3,943	.....	52,414	.....	150	17,102	52,402	166,811
15						4,485	5,510	3,759	.....	3,508	16,670	.....	30,060	.....	555	8,992	50,428	123,967
16					2,765	1,233	660	.....	.....	2,354	8,399	.....	23,502	.....	.....	140	30,824	69,877
17					5,583	.....	252	.....	.....	1,962	3,763	.....	22,758	.....	.....	846	28,473	63,995
18			3,696	.....	5,537	2,615	5,496	.....	.....	3,867	586	.....	41,987	.....	.....	1,927	35,447	101,158
Totals in Feet....	1,559	1,380	12,512	5,460	72,887	73,917	89,471	29,552	665	74,700	124,808	6,359	542,050	1,625	10,886	81,287	651,571	1,780,689

The foregoing general system, comprising 1,780,689 linear feet, or 337.25 miles, is subdivided into 86 secondary systems, as set forth in the following table, which shows their distribution in the three divisions of the City, the streets in which their outfalls are located, and also the diameters of the various sewers at their outfalls:

NORTH DIVISION SUB-SYSTEMS.

No.	STREETS.	Diameter at Outfall.	No.	STREETS.	Diameter at Outfall.
1	Rush street.....	5 feet.	8	Erie street.....	3 feet.
2	State street.....	2 "	9	Chicago avenue.....	4 "
3	Dearborn street.....	2 "	10	Halsted street.....	3 "
4	Clark street.....	6 "	11	Division street.....	3 "
5	La Salle street.....	1½-1¾ ft.	12	North avenue.....	4½ "
6	Wells street.....	2 feet.	13	Clybourne avenue.....	4 "
7	Franklin street.....	6 "	14	Webster avenue.....	4 "

The total length of sewers in the North Division, as represented by the above 14 sub-systems, is 358,997 linear feet, or 67.99 miles, and is equal to 20.16 per cent. of the entire general system of the city.

SOUTH DIVISION SUB-SYSTEMS.

No.	STREETS.	Diameter at Outfall.	No.	STREETS.	Diameter at Outfall.
1	Michigan avenue.....	4 feet.	21	Fourteenth street.....	2½ feet.
2	Wabash avenue.....	2 "	22	Fifteenth street.....	2 "
3	State street.....	2½ "	23	Sixteenth street.....	3 "
4	Dearborn street.....	2 "	24	Eighteenth street.....	3 "
5	Clark street.....	2 "	25	Nineteenth street.....	3 "
6	La Salle street.....	1½ & 1¾ ft.	26	Stewart avenue.....	3 "
7	Fifth avenue.....	2 feet.	27	Twenty-second street..	3 "
8	Franklin street.....	2 "	28	Wallace street.....	6 "
9	Lake street.....	1 "	29	Helsted street.....	5 "
10	Randolph street.....	2 & 3 "	30	Quarry street.....	3 "
11	Washington street...	3 "	31	Main street.....	3 "
12	Madison street.....	3 "	32	Deering street.....	3 "
13	Monroe street.....	3 "	33	Archer avenue, West...	3 "
14	Adams street.....	3 "	34	Archer avenue, East...	3 "
15	Jackson street.....	3 "	35	Thirty-first street.....	5 "
16	Van Buren street.....	3 "	36	Douglas avenue.....	4½ "
17	Harrison street.....	3 "	37	*Twelfth street.....	5 "
18	Polk street.....	2½ "	38	*Twenty-second street.	6 "
19	Taylor street.....	3 "	39	*Douglas avenue.....	6 "
20	Twelfth street.....	2½ "			

* In the Lake.

The total length of sewers in the South Division, as represented by the above 39 sub-systems, is 505,800 linear feet, or 95.79 miles, and is equal to 28.40 per cent. of the entire general system of the City.

WEST DIVISION SUB-SYSTEMS.

No.	STREETS.	Diameter at Outfall.	No.	STREETS.	Diameter at Outfall.
1	Clybourne place.....	2 feet.	18	Van Buren street.....	5 feet.
2	North avenue.....	6 "	19	Harrison street.....	5 "
3	Blackhawk street....	5 "	20	Polk street.....	4 "
4	Division street.....	5 "	21	Taylor street.....	5 "
5	Augusta street.....	5 "	22	Twelfth street.....	5 "
6	Chicago avenue.....	3 "	23	Maxwell street.....	5 "
7	Erie street.....	3 "	24	Fourteenth street....	4 "
8	Kinzie street.....	6 "	25	Sixteenth street.....	4 "
9	Carroll avenue.....	2 "	26	Eighteenth street.....	4 "
10	Fulton street.....	4 "	27	Twenty-second street..	2½ "
11	Lake street.....	2 "	28	Halsted street.....	4 "
12	Randolph street.....	5 "	29	Morgan street.....	4½ "
13	Washington street....	2 "	30	Center avenue.....	4½ "
14	Madison street.....	5 "	31	Ashland avenue.....	5½ "
15	Monroe street.....	2 "	32	Leavitt street.....	6½ "
16	Adams street.....	5 "	33	Western avenue.....	5 "
17	Jackson street.....	2 "			

The total length of sewers in the West Division, as represented by the above 33 sub-systems, is 915,892 linear feet, or 173.47 miles, and is equal to 51.44 per cent. of the entire general system of the City.

During the year just closed the general system has been enlarged and extended by an addition of 79,128 linear feet, or 15 miles, of new sewers, the location and diameters of all of which are given in the following tables, alphabetically arranged for convenient reference:

NORTH DIVISION.

SEWERS CONSTRUCTED DURING THE YEAR 1880.

IN	FROM	TO	DIAM'T'RS
"A" street.....	Southport avenue.....	Dominick street. . .	12 in. pipe
"B" street.....	Southport avenue.....	Dominick street....	12 in. pipe
Clybourne avenue	Racine avenue.....	Webster avenue....	2 ft. brick
Clybourne avenue	Cooper street.....	Ashland avenue . . .	15 in. pipe
Clybourne avenue	Fullerton avenue.....	Ashland avenue . . .	12 in. pipe
Franklin street...	Eugenie street	Florimond street....	15 in. pipe
Florimond street.	Wells street.....	Franklin street....	12 in. pipe
Hammond street.	Eugenie street.....	North 181 feet.....	12 in. pipe
Lincoln Place . . .	Webster avenue.....	South 338 feet.....	12 in. pipe
Locust street.....	Clark street	La Salle street . . .	12 in. pipe
N. Grove court...	Larrabee street.....	210 ft. E. of Orchard street.	12 in. pipe
Poe street	Kroger street	Clyde street.....	12 in. pipe
Southport avenue	Belden avenue	Fullerton avenue....	12 in. pipe
Southport avenue	Webster avenue.....	Clybourne avenue....	12 in. pipe
Southport avenue	Clybourne avenue . . .	Hawthorne avenue..	18 in. pipe
Sheffield avenue..	Clay street.....	Centre street.....	12 in. pipe
Ward street.....	Webster avenue.....	Belden avenue . . .	2 ft. brick
Webster avenue..	Hurlbut street	West 246 ft	12 in. pipe

The total length represented by the foregoing is 9,990 linear feet, or 1.89 miles; and is equal to 12.63 per cent. of the entire construction during the year 1880.

WEST DIVISION.

SEWERS CONSTRUCTED DURING THE YEAR 1880.

IN	FROM	TO	DIAM'TES
Augusta street	Wood street	Lincoln street	4½ ft. brick
Alley Way	Centre Adams street	South 49 ft.	12 in. pipe wing
Alley Way	Centre Jackson street	North 45 ft.	12 in. pipe wing
Alley Way	Centre Jackson street	South 38 ft.	12 in. pipe wing
Alley Way	Centre Van Buren street	North 44 ft.	12 in. pipe wing
Ashland avenue	Twelfth street	Taylor street	3 ft. brick
Ashland avenue	Taylor street	Polk street	2½ ft. brick
Ashland avenue	Polk street	Harrison street	2 ft. brick
Ashland avenue	North avenue	Waubansia avenue	15 in. pipe
Commercial street	North avenue	Waubansia avenue	2 ft. brick
Elizabeth street	Carroll avenue	North to R. R.	12 in. pipe
Evergreen place	Oakley street	Leavitt street	12 in. pipe
Evergreen street	Park street	E. of Leavitt street	12 in. pipe
Ellen street	Milwaukee avenue	Lincoln street	12 in. pipe
Flournoy street	Robey street	Leavitt street	12 in. pipe
Fowler street	Milwaukee avenue	Hoyne avenue	2½ ft. brick
Holt street	North avenue	Waubansia avenue	15 in. pipe
Hoyne avenue	Evergreen street	Ewing place	2 ft. brick
Hoyne avenue	Harrison street	Flournoy street	2 ft. brick
Iowa street	Wood street	Lincoln street	12 in. pipe
Jackson street	Loomis street	300 ft W. of Laflin st.	12 in. pipe
Jackson street	Hoyne avenue	Leavitt street	12 in. pipe
Jackson street	Western avenue	Oakley street	18 in. pipe
Jackson street	Irving avenue	Oakley street	12 in. pipe
Laflin street	Van Buren street	Jackson street	2 ft. brick
Lincoln street	Huron street	Superior street	12 in. pipe
Lincoln street	Milwaukee avenue	Ellen street	15 in. pipe
Lincoln street	Division street	Iowa street	15 in. pipe
Lull place	Wood street	East 356 ft.	15 in. pipe
Lull place	Lull place, west	Ellen street	12 in. pipe
Leavitt street	Harrison street	Evergreen place	2 ft. brick
Leavitt street	Blue Island avenue	Twenty-second st.	6 ft. brick
May street	Chicago avenue	Huron street	15 in. pipe
Marion street	Division street	Ellen street	15 in. pipe
Macedonia street	Division street	Ellen street	15 in. pipe
Mantene court	Milwaukee avenue	South 258 ft.	12 in. pipe
Nixon street	Taylor street	North 555 ft.	12 in. pipe
Noble street	Augusta street	Emma street	12 in. pipe
Newton street	Division street	Thomas street	15 in. pipe
Newton street	Augusta street	Iowa street	15 in. pipe
Owasco street	Western avenue	West 372 ft.	12 in. pipe
Ogden avenue	Wood street	Van Buren street	18 in. pipe
Ogden avenue	Wood street	Jackson street	12 in. pipe
Paulina street	Augusta street	Emma street	15 in. pipe
Paulina street	Division street	Jane street	15 in. pipe
Paulina street	Emma street	Jane street	12 in. pipe
Robey street	Harrison street	Flournoy street	2 ft. brick
Robey street	Evergreen street	Ewing place	2 ft. brick
Robey street	Lake street	Park avenue	12 in. pipe
Robey street	Washington street	Warren avenue	12 in. pipe
Rumsey street	Cornelia street	South 200 ft.	12 in. pipe
Seymour street	Division street	North 150 ft.	18 in. pipe
Samuel street	Augusta street	Emma street	15 in. pipe
Samuel street	Cornelia street	Clarinda street	12 in. pipe
Taylor street	Ashland avenue	Nixon street	15 in. pipe
Twenty-second st.	Leavitt street	West 1559 ft.	9 ft. brick
Wood street	Division street	Ellen street	2 ft. brick

The total length represented by the foregoing is 36,589 linear feet, or 6.98 miles, and is equal to 46.58 per cent. of the entire construction during the year 1880.

SOUTH DIVISION.

SEWERS CONSTRUCTED DURING THE YEAR 1880.

IN	FROM	TO	DIAM'T'RS
Butler street....	McGregor street.....	Twenty-fifth street..	15 in. pipe
Butler street....	Twenty-sixth street....	Napoleon place.....	18 in. pipe
Calumet avenue..	Thirty-first street.....	Thirty-second st....	12 in. pipe
Calumet avenue..	Douglas avenue.....	Thirty-fourth street..	15 in. pipe
Calumet avenue..	Thirty-fourth street....	North 261 feet.....	12 in. pipe
Cottage Grove ave	Thirty-first street.....	Thirty-second st....	15 in. pipe
Cottage Grove ave	Thirty-second street...	University place....	18 in. pipe
Church street....	Archer avenue.....	A. & St. L. R. R....	12 in. pipe
Cologne street...	Main street.....	Deering Street.....	12 in. pipe
Dearborn street..	Douglas avenue.....	Thirty-third street..	12 in. pipe
Dashiel avenue..	Twenty-eighth street...	Twenty-ninth street..	18 in. pipe
Dashiel avenue..	Douglas avenue.....	Thirty-sixth street..	2½ ft. brick
Dashiel avenue..	Thirty-sixth street....	Thirty-seventh st....	2 ft. brick
Dashiel avenue..	Thirty-seventh street...	Thirty-eighth street..	18 in. pipe
Douglas avenue..	Emerald avenue.....	Wallace street.....	4 ft. brick
Douglas avenue..	Wood street.....	Lincoln street.....	12 in. pipe
Forest avenue..	237 ft. S. of Thirty-seventh street..	Thirty-eighth street..	2 ft. brick
Groveland Pk. ave	Thirty-first street.....	Thirty-second st....	15 in. pipe
Groveland Pk. ave	Thirty-second street....	Thirty-third street..	18 in. pipe
Hanover street..	Twenty-sixth street....	Napoleon place.....	18 in. pipe
Lowe avenue....	Douglas avenue.....	Thirty-sixth street..	2½ ft. brick
Lowe avenue....	Thirty-sixth street....	Thirty-seventh st....	2 ft. brick
Lowe avenue....	Thirty-seventh street...	Thirty-eighth street..	18 in. pipe
Rhodes avenue..	Douglas avenue.....	Thirty-third street..	3 ft. brick
Shields avenue..	Thirty-first street.....	North 400 feet.....	18 in. pipe
Stanton avenue..	Thirty-seventh street....	South 361 feet.....	2 ft. brick
Stanton avenue..	361 ft. S. of Thirty-seventh street..	South 271 feet.....	18 in. pipe
So. Park avenue..	Douglas avenue.....	S. line Douglas ave..	18 in. p.wing
So. Park avenue..	S. line Douglas avenue..	Thirty-seventh st....	18 in. pipe
Twenty-third st..	State street.....	Dearborn street....	18 in. pipe
Twenty-third st..	Dearborn street.....	Butterfield street...	15 in. pipe
Twenty-third st..	Butterfield street.....	Clark street.....	12 in. pipe
Twenty-fourth st.	State street.....	Dearborn street....	18 in. pipe
Twenty-fourth st.	Dearborn street.....	Butterfield street...	15 in. pipe
Twenty-fourth st.	Butterfield street.....	Clark street.....	12 in. pipe
Twenty-ninth st.	Cottage Grove avenue..	Groveland Pk. ave..	2 ft. brick
Thirty-third st..	Rhodes avenue.....	Lake avenue.....	2 ft. brick
Thirty-fourth st.	Halsted street.....	Auburn street.....	12 in. pipe
Thirty-fourth c't.	Halsted street.....	Auburn street.....	12 in. pipe
Wallace street...	Twenty-sixth street....	Thirty-first street..	5 ft. brick
Wallace street...	Douglas avenue.....	Thirty-sixth street..	2½ ft. brick
Wallace street...	Thirty-sixth street....	Thirty-seventh st....	2 ft. brick
Wood street.....	Archer avenue.....	Douglas avenue.....	20 in. pipe

The total length represented by the foregoing is 32,279 linear feet, or 6.11 miles, and is equal to 40.79 per cent. of the entire construction during the year 1880.

There remain to be constructed under contracts awarded during the past year, and still in force, 45,192 linear feet of sewers, classified as below, viz.:

23,580 feet of 12 inch pipe sewer.
 2,557 feet of 15 inch pipe sewer.
 4,790 feet of 18 inch pipe sewer.
 2,592 feet of 2 feet brick sewer.
 700 feet of 3 feet brick sewer.
 2,654 feet of $3\frac{1}{2}$ feet brick sewer.
 3,016 feet of $4\frac{1}{2}$ feet brick sewer.
 1,450 feet of 6 feet brick sewer.
 3,853 feet of 9 feet brick sewer.

45,192 linear feet, or 8.56 miles, all of which will be finished and in use by July of the current year.

The following tabular statement shows the number of new catch basins and man holes constructed during the past year, as well as the total number of both in place and in use at this date:

	DIVISIONS.			Total construc'd during 1880.	In place 31st Dec., 1879.	Total in place 31st Dec., 1880.
	North.	West.	South.			
Catch basins constructed	23	137	111	271	9,791	10,062
Man holes constructed.	80	252	222	554	11,399	11,953

Of the foregoing, the cost of constructing 11 new man holes, also the cost of constructing the 271 new catch basins, appertain strictly to the item of maintenance of the general sewerage system, the details of which are given below:

SEWERAGE DEPARTMENT.

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MAINTENANCE AND REPAIRS, 1880.

DESCRIPTION OF MATERIALS AND QUANTITIES OF SAME USED THEREIN,
IN THE NORTH DIVISION.

No.	CHARACTER OF WORK.	CEMENT, BLS.	BRICKS.	COVERS, WOOD.		STRAIGHT PIPE, in feet.		CURVES.		BOXES, feet.	BOTTOMS.	GRATES.		TRAPS.	SAND, CUBIC YDS.
				New.	Old.	9 in.	12 in.	9 in.	12 in.			9 in.	12 in.		
6	Man holes constructed.....	21	4,200	4	2	..	..	..	..	1	..	..	..	..	6
23	Catch basins constructed.....	86	25,160	20	3	84	176	12	36	..	23	13	2	1	20
116	Man holes adjusted to grade.....	59½	13,150	53	27	..	..	..	..	..	..	..	..	..	..
167	Catch basins adjusted to grade...	104	26,400	106	23	..	70	..	4	464	..	..	..	..	4
31	Man holes repaired.....	7½	3,200	5	..	..	..	..	..	..	..	..	..	..	3
32	Catch basins repaired.....	7	2,350	..	..	..	..	..	..	..	..	..	..	..	2
Total quantities used in N. Div.		285	74,400	188	55	84	246	12	40	1	464	23	13	2	1

MAINTENANCE AND REPAIRS, 1880.

DESCRIPTION OF MATERIALS AND QUANTITIES OF SAME USED THEREIN
IN THE SOUTH DIVISION.

No.	CHARACTER OF WORK	CEMENT, BLS.	BRICKS.	COVERS.			Straight Pipe, in feet.		CURVES.		Junctions, Pieces of.			12 in. SLANTS.	BOTTOMS.	GRATES.	12 in. TRAPS.	SAND, CUBIC YARDS.
				Wood, New.	Wood, Old.	Iron.	9 in.	12 in.	9 in.	12 in.	6"×12"	9"×12"	6"×15"					
2	Man holes constr'd	6	2,300	2	..	..	..	4	..	..	..	..	..	..	..	..	2	..
111	Catch basins const'd	356	115,750	103	8	..	570	897	78	208	4	7	2	1	111	37	1	50
230	Man holes adjusted to grade	114	27,350	128	35	2	..	..	..	..	..	..	..	..	..	..	19	..
191	Catch basins adjus'd to grade	122½	27,100	81	32	1	..	33	..	2	..	..	..	..	..	..	19	..
50	Feet of 3 feet sewer repaired	13	3,000	1	..	..	..	60	..	4	..	..	..	..	..	..	5	..
Total quantities used in South Div.		611½	175,500	315	75	3	570	994	78	214	4	7	2	1	111	37	1	95

MAINTENANCE AND REPAIRS, 1880.

DESCRIPTION OF MATERIALS AND QUANTITIES OF SAME USED THEREIN,
IN THE WEST DIVISION.

No.	CHARACTER OF WORK.	CEMENT, BBLs.	BRICKS.	COVERS		Straight PIPE, IN FEET		CURVES		JUNCTIONS 9" x 12"		SLANTS		BOXES, FEET.	BOTTOMS.	GRATES.	SAND, CUBIC Yds.
				Wood, new	Wood, old.	Iron.	9 in.	12 in.	9 in.	12 in.	Junctions 9" x 12"	12 in.	15 in.				
3	Man holes constructed....	11	4,300	3	..	..	..	..	..	..	..	..	1	..	..	..	3
137	Catch basins constructed....	482½	153,650	137	..	..	723	1,116	178	230	9	1	..	..	137	70	100
356	Man holes adjusted to grade.....	163¼	38,425	193	8	4	..	..	..	..	..	..	1	..	..	..	20
400	Catch basins adjust'd to grade.....	284¼	68,450	244	32	..	..	100	..	..	..	..	..	1,798	..	..	20
24	Man holes repaired.....	6	1,500	5	..	..	..	..	..	..	..	..	..	..	..	..	..
63	Catch basins repaired.....	39½	11,800	6	..	..	..	..	..	..	..	..	..	..	..	..	..
368	Feet of 2 ft. sewer repaired	28	10,000	..	..	..	..	..	..	..	..	..	..	..	..	..	..
75	Feet of 4½ ft. sewer rep'd..	35	11,000	..	..	..	..	20	..	4	..	..	..	100	..	..	42
16	Feet of 5 ft. sewer repaired	10	2,000	..	..	..	..	..	..	..	..	..	..	..	..	..	..
10	Feet of 6 ft. sewer repaired	10	3,000	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Total quan. used in W.Div.		1075½	304,125	588	40	4	723	1,236	178	234	9	1	2	1,898	137	70	185

The average cost of the new catch basins and man holes, the details of the construction of which are given above, was, for the catch basins, \$45.44 each, and for the man holes \$47.04 each.

MAINTENANCE, 1880.

CLEANING SEWERS, CATCH BASINS AND MAN HOLES, AND EXAMINATION AND INSPECTION OF SAME, IN THE NORTH DIVISION.

CHARACTER OF WORK.	Days of Gen'l Foreman	Days of Asst. Foreman	Days of Labor.	Days of Double Team.	Days of Flushing Team (4 Horses.)	Days of Single Horse and Wagon.	Length of Sewers Cleaned in feet.	Number of Catch Basins Cleaned.	Number of Man Holes Cleaned.
Sewers cleaned by scraping.....	13½	41	435	39½			34,200		
Sewers cleaned by flushing.....		41½	123		41		67,223		
Sewers cleaned by derrick and scraper.....	3	3½	37	10½			2,161		
Cleaning catch basins.....	50	119	1,152	261				1,750	
Cleaning man holes.....		7	7			7			2
Attending to complaints, examin'g sewers, and opening inlets to catch basins.....		29	35			14			
Examining condition of sewers as to depth of solid deposit therein.....		14	111	19					
Inspection of new sewers.....		11	6			10			
Totals.....	66½	266	1,906	320	41	31	103,584	1,750	2

SOUTH DIVISION.

CHARACTER OF WORK.	Days of Gen'l Foreman	Days of Ass't Foreman.	Days of Common Labor	Days of Double Team.	Days of Flushing Team (4 Horses.)	Days of Single Horse and Wagon.	Length of Sewers Cleaned in feet.	Number of Catch Basins Cleaned.
Sewers cleaned by scraping.....	10	25	239	25	.....	.....	26,000	.....
Sewers cleaned by flushing.....	6	111	327	.....	108	.....	156,366	.....
Sewers cleaned with derrick and scraper ...	4	34	180	27	.....	.....	6,858	.....
Cleaning catch basins.....	86	324	2,029	319	.....	8	.....	2,870
Attending complaints, examining sewers, and opening inlets to catch basins.....	.....	56	56	.....	.....	43	.....	.....
Examining condition of sewers as to depth of solid deposit therein.....	.....	34	113	20	.....	.....	.....	.....
Totals	106	585	2,944	421	108	51	180,224	2,870

WEST DIVISION.

CHARACTER OF WORK.	Days of Gen'l Foreman	Days of Ass't Foreman.	Days of Common Labor	Days of Double Team.	Days of Flushing Team (4 Horses.)	Days of Single Horse & Wagon.	Length of Sewers Cleaned in feet.	Number of Catch Basins cleaned.
Sewers cleaned by scrapers	31	66	572	35	.....	.....	59,450	.....
Sewers cleaned by flushing.....	.....	117	347	12	113	12	209,088	.....
Cleaning catch basins.....	112	320	2,850	418	.....	.....	.....	4,503
Attending complaints, examining sewers, and opening inlets to catch basins.....	.....	82	108	.....	.....	44	.....	.....
Examining condition of sewers, as to depth of solid deposit therein.....	.....	61	212	51	.....	.....	.....	.....
Inspection of new sewers.....	.....	8	8	.....	.....	8	.....	.....
Totals	143	654	4,097	516	113	54	268,538	4,503

The prices paid per diem for the work detailed above, were, for the general foreman, including his horse and wagon, \$5; assistant foreman, \$2.75; laborers, \$2.25; double teams, with wagons and drivers, \$3.00; four horse flushing teams, with drivers, \$5.50, and single horse, wagon and driver, \$1.75.

During the year just closed large additions have been made to the system of house drainage, the extent and character of which is shown in detail in the following tabular statements:

PERMITS ISSUED DURING THE YEAR 1880.

DIVISIONS.	PERMITS ISSUED FOR					
	18 inch.	15 inch.	12 inch.	9 inch.	6 inch.	Total.
West .....	.....	1	16	45	1,457	1,519
South	1	2	5	79	770	857
North .....	.....	.....	4	22	636	662
Totals	1	3	25	146	2,863	3,038

JUNCTIONS PUT IN PLACE DURING THE YEAR 1880.

43 pieces 6 inch slant junctions.
 86 pieces 9 inch slant junctions.
 25 pieces 12 inch slant junctions.
 3 pieces 15 inch slant junctions.
 1 piece 18 inch slant junctions.
 67 pieces 6 inch by 12 inch "Y" junctions.
 3 pieces 6 inch by 12 inch "Y" junctions.
 89 pieces 9 inch by 12 inch "Y" junctions.
 3 pieces 9 inch by 15 inch "Y" junctions.

320 pieces, total.

**HOUSE DRAINS, OR PRIVATE SEWERS, PUT IN PLACE DURING
THE YEAR 1880.**

DATE.	Linear Feet.	Total Linear Feet.
SIX-INCH PIPE—		
In place 31st December, 1879.....	1,631,704	
Put in during the year 1880.....	132,322	
Total 6-inch Drains in place 31st Dec., 1880...		1,764,026
NINE-INCH PIPE—		
In place 31st December, 1879.....	62,914	
Put in during the year 1880.....	5,325	
Total 9-inch Drains in place 31st Dec., 1880...		68,239
TWELVE-INCH PIPE—		
In place 31st December, 1879.....	7,839	
Put in during the year 1880.....	900	
Total 12-inch Drains in place 31st Dec., 1880...		8,739
FIFTEEN-INCH PIPE—		
In place 31st December, 1879.....	134	
Put in during the year 1880.....	108	
Total 15-inch Drains in place 31st Dec., 1880...		242
TWENTY-FOUR INCH BRICK—		
In place 31st December, 1879.....	80	
Put in during the year 1880.....	36	
Total 24-inch Drains in place 31st Dec., 1880...		116
Grand Total in place 31st December, 1880.....		1,841,362

This is equal to 348.74 miles, and, taking the population of the City to be 503,501, as per census of 1880, it is equal to 3.657 linear feet of house drains, measured from the sewers in the centers of the streets to the curb lines, to each man, woman and child in the City.

With the following detailed statement of the construction of Main, Sub-main and Lateral Sewers during the year 1880, that portion of this report referring to the construction, maintenance and repairs of the general sewerage system of the City of Chicago is concluded:

12 Inch Pipe Sewers.....	24,463	Linear Feet.
15 " " ".....	13,446	" "
18 " " ".....	10,886	" "
20 " " ".....	1,625	" "
2 Feet Brick Sewers.....	13,882	" "
2½ " " ".....	4,905	" "

3 Feet Brick Sewers	2,113 Linear Feet.
4 " " "	995 " "
4½ " " "	668 " "
5 " " "	2,614 " "
6 " " "	1,972 " "
9 " " "	1,559 " "

Total put in place during the year 1880, 79,128 linear feet, equal to 15 miles.

So much has been said—*pro* and *con*—about the extent and condition of the sewerage system of the City of Chicago—to all of which statements I have invariably replied that it would, upon critical examination, be found to compare favorably with any city in this country or elsewhere, that I am tempted to submit the following original exhibit of the general drainage systems of eight of the principal cities of the United States, in which it will be found the City of Chicago occupies *no* secondary position:

CITIES. 31st December, 1880.	Area in Acres.	Population by Census of 1880.	Sewers in linear feet.	Density of Population per Acre.	Square feet of Area to each Inhabitant.	Linear feet of Sewers per Acre.	Linear feet of Sewers per head of Popula- tion.
New York.....	26,401	1,206,577	2,041,264	45.70	953	77.3	1.69
Philadelphia	82,803	846,980	1,056,000	10.23	4,258	12.9	1.25
Brooklyn.....	13,338	566,689	1,592,659	42.49	1,025	119.4	2.81
Chicago.....	22,797	503,501	1,780,689	22.00	1,973	78.8	3.54
Boston.....	4,416	362,535	1,056,000	82.00	531	239.0	2.91
St. Louis.....	40,000	350,522	1,068,144	8.76	4,971	26.7	3.04
Cincinnati.....	15,360	255,708	249,920	16.64	2,617	16.3	0.98
San Francisco...	26,880	233,956	660,000	8.70	5,005	24.5	2.82

Thus it will be seen that the City of Chicago, *fourth* on the list as regards population, and *seventh* as regards age, occupies the *first place* when we come to consider the linear feet of

sewerage—finished and in use—per head of population. It is true that much remains to be done in the way of extending certain portions of the present general system, together with the construction of additional sub-systems and systems of interception, for the purpose of reaching, at a proper grade, large portions of the outlying districts and thinly populated wards, especially in the western part of the City. Nevertheless, what is done has been well done, and time, with a largely decreased death rate, will vindicate the truth of these remarks.

And yet, what is true in this respect of Chicago—yesterday a village, to-day a large and flourishing city—is equally true of all other American cities, many of whom were extensive and important centers of population and of commerce when the site of the present City of Chicago was still the home of the bison and the red man.

As a corollary of the foregoing observations, attention is now invited to a consideration of what may be regarded as the best, speediest and most economical method of reaching and draining those districts situated in the western, northwestern and southwestern portions of the City. Taking them up in the order in which they stand, and beginning with the district lying west of Rockwell street and Western avenue, north of the west fork of the south branch of the Chicago River, east of the city line at Crawford avenue, and south of the natural divide at Kinzie street, I am led, after a careful study of the entire subject, to recommend the early completion of the intercepting sewer in Twenty-second street (now under way from Leavitt to Sacramento street), westwardly in Twenty-second street to Crawford avenue, and eastwardly in Twenty-second street to Laflin street, and thence southward in Laflin street to its natural outfall at the foot of the latter street, at which point its discharge will be brought within the immediate influence of the Canal at Bridgeport, or of any hydraulic works that may be erected at that point, or at what would seem to be the natural location for such works—at the extreme head of the south fork of the South Branch, at or near the Stock Yards. This sewer, located as sug-

gested, with an intelligent understanding as to its proper grade and sectional area, and with the construction of storm-water overflows at its intersection with Leavitt street, and with Western avenue and California avenue, would in my opinion take care of all the drainage discharged into it by the sub-main sewers located northward of Twenty-second street, and in Ashland avenue, Wood, Robey and Leavitt streets, Western avenue, California avenue, Kedzie avenue and Central Park avenue; and, as a much needed extension of this system, I would recommend the early completion of the sewer in California avenue, from Twenty-second street to Kinzie street, and the construction of a similar sub-main in Kedzie avenue, likewise from Twenty-second street to the divide at Kinzie street. All of this work is sadly needed, and nothing should be allowed to stand in the way of its location and completion at an early day. The drainage of that portion of the above district lying between the west fork of the South Branch and Twenty-second street, and, generally, between Laflin street on the east and Crawford avenue on the west, should be carried into an intercepting sewer, located along the north shore of the west fork of the South Branch, which in turn should discharge into the main drainage sewer in Twenty-second street at or near the intersection of the latter street with Blue Island avenue. In my opinion, no sewage should be discharged into the west fork of the South Branch, nor, as a rule, into any stream or estuary uninfluenced by hydraulic reaction in some form, either natural or artificial.

But little more, if anything, can be done to meet the increasing demands for deeper drainage in the Northwestern portion of the City, by any extension of the present sub-systems in that direction. At an early day a large main will have to be constructed, having its outfall on the west shore of the North Branch at some point between Canal place and Wabansia avenue. Bloomingdale road has been suggested, as I am informed, by my accomplished predecessor, Mr. Benezette Williams, and I am favorably inclined in regard to the same locality. Starting from the outfall portal at this point, I recommend that the main line be located in Bloomingdale road, westward from

the river to North Wood street, southward in the latter street to North avenue, westward in the latter avenue to North Leavitt street, southward in North Leavitt street to Hirsch street, westward in Hirsch street to North California avenue, southward in the latter avenue to Augusta street, and thence westward in Augusta street to the city line at Crawford avenue. This sewer, properly designed and located as to dimensions and grade, and with its accompanying system of sub-main and lateral sewers, will effectually drain the district lying between North avenue and West Kinzie street, and between North Leavitt street and Crawford avenue; and by a judicious arrangement and location of a secondary system, having its discharge into the main sewer at or near the intersection of Bloomingdale road with North Wood street, the district bounded by North avenue on the south, Western avenue on the west, and, generally, by the north branch of the Chicago River on the east, would be thoroughly and effectually drained.

The drainage of the southwestern district, lying between the canal and Egan avenue, and the south fork of the south branch of the Chicago River and Western avenue, should be provided for at an early day by extending the sewer in Archer avenue from its present terminus at Wood street to Western avenue, and by the construction of sewers in Douglas avenue from the south fork of the South Branch to Western avenue; in Thirty-third street, from Ashland avenue to Oakley street; and, at a later date, in Thirty-seventh street, from the south fork to Western avenue.

So much has been said and written in regard to the proper method of ventilating sewers in general, that the subject has almost been worn threadbare. Suffice it to say for the present, the one way, the speediest way, the most economical way, and, in my opinion, the only practical way to ventilate the sewerage system of the City of Chicago, is by and through the man holes and catch basins, by placing perforated covers on all the man holes and by constructing the catch basins without traps of any description. Of course there are some objectionable features

about the use of untrapped catch basins, because of their greater proximity to the houses; and this objection would apply with greater force were this plan to be depended upon alone; but, out of some three hundred catch basins constructed without traps during the past year, I have yet to hear a single complaint in regard to their introduction and use as a temporary expedient for increasing and assisting the atmospheric currents so essential to the proper ventilation of all sewers, and particularly so as regards the sewerage system of this city. The large number of timber man hole covers in use—upwards of twelve thousand—early led me to devise some method by which they could be utilized and their cost saved to the city, and this has been done by perforating the “lids” of all new covers and of all old ones whenever repairs were necessary, by boring five $2\frac{1}{2}$ inch holes in all “lids” put in place during the past year. The only objection to this plan is that the roadway detritus, by sifting through the holes, finds an unobstructed passage way into the sewers, which, if allowed to accumulate, might, in time, prove a serious obstruction to the natural flow of the sewage. To obviate this difficulty I have designed, and hope to submit at an early day, a plan for a sheet iron “detritus interceptor,” which, while preventing anything from finding its way into the sewers through the perforated man hole covers, at the same time allows the free passage of the gases of decomposition out from, or the unobstructed flow of the external atmosphere into, the sewers through slotted openings in its sides. Upwards of twelve hundred of these perforated oaken lids have been quietly put in use, and the fact that the complaints of the presence of sewer gas in the interior of houses are rapidly decreasing in number and frequency, would seem to indicate that the plan which I have herein outlined is gradually but surely mitigating this serious evil, and, if steadily pursued, will ultimately remove it altogether.

A careful study of the present method of cleaning our sewers, aided by a knowledge of the various plans suggested or in actual use in this country and abroad for the attainment of the same end, leads me to the conclusion that, for the present anyway, we

cannot, without the expenditure of a very considerable sum of money, very greatly improve upon the manner of doing this work, which has been in successful operation here for some years past. The low grades upon which the sewers of this City are necessarily constructed, together with the fact that the "dead ends," or heads, of the various sub-systems are rarely more than five feet beneath the surface of the streets; while it does not prevent the construction and use of permanent "automatic flush tanks," or similar contrivances, would, nevertheless, appear to render their introduction into the sewerage system of this City as of doubtful expediency. The influence of a flush, the length of a sewer that it will properly cleanse, depends upon the volume of water used and the hydraulic head under which it acts. Our portable flush tanks hold upwards of 300 cubic feet of water, and this entire volume is discharged into the sewers of 2 feet diameter and less, generally through a pipe of the same, or slightly smaller diameter, and always under a hydraulic head of from ten to twenty feet. Of course the automatic stationary tanks could be used—their dimensions and position being regulated by the character and magnitude of the work to be done; but supposing them to be located beneath the surface of the streets, the average hydraulic head under which they would act, and, consequently, the initial velocity with which the volume of water would enter the sewer—which, by the way, is the true measure of its energy and ability to thoroughly do its work—would be considerably less than by the present system. I have a high opinion of these automatic flushing tanks, particularly where used in connection with the smaller pipes, rendered possible by the adoption of the separate system of sewerage recently introduced into this country, and ably advocated by Colonel Waring; but I doubt their utility in connection with the low gradients, comparatively large diameters and great length of the sewers in Chicago. A resort to the use of the water mains has been suggested, and this would doubtless do the work, provided the diameter of the pipe, and consequent volume of water was sufficiently large at the points where its application was imperative. If this were not the case, it would be necessary to impound the water in a considerable length of the sewer by the use of the ex-

pensive, and, in some respects, objectionable system of fixed valves or flushing gates. I say in some respects objectionable, because wherever water or sewage is thus impounded, more or less danger is always to be apprehended from the water backing up through the neighboring house drains and flooding the premises to a greater or lesser extent. The fact that recent and most thorough examination of every foot of the entire sewerage system of this City—many of the individual sewers in which had not been cleaned in some years—showed comparatively but little solid deposit, while most of the smaller sewers were quite clean and entirely free from any deposit at all, would seem to indicate that our present method of cleansing and flushing is to a large degree closed against any serious objections whatever.

Where every one has performed the duties assigned him faithfully, efficiently and well, it is most difficult to make any distinctions which would not partake more or less of an invidious character; and yet, while disclaiming the most remote intention to remain silent as to the merits of all, I would be ungrateful if I failed to close this report without referring to the high order of efficiency, faithfulness and devotion to duty always and at all times displayed by the Assistant and Division Engineers, Messrs. Richard Potts, William Lowe, Henry L. Bristol and Alexander W. Cooke; to the two Chief Clerks, Messrs. L. B. Brady and B. F. Davenport; the Draughtsman, Mr. G. R. Hoffman; the Assistant Clerks, Messrs. Jno. O'Leary and Richard Crowe; the Chief Inspector of House Drains, Mr. P. D. Sullivan, and the General Foreman, Mr. Patrick Ryan, all of whom I recommend to your kindness and consideration.

G. HOWARD-ELLERS,

Engineer Sup't, Etc.

STREET DEPARTMENT.

CHICAGO, December 31st, 1880.

CHARLES S. WALLER,

Commissioner of Public Works.

DEAR SIR: I submit herewith the Fifth Annual Report of the Street Department.

There have been completed the following improvements during the past year, to-wit:

Wooden blocks.....	13 ³⁵⁹⁴ ₅₂₈₀	Miles.
Macadam	22 ⁵⁹² ₅₂₈₀	"
Stone	01 ⁰³⁶ ₅₂₈₀	"
Graveling.....	01 ⁷⁸⁶ ₅₂₈₀	"
Oak planking.....	01 ⁰³⁶ ₅₂₈₀	"
Curb wall and filling.....	1 ¹⁶⁴¹ ₅₂₈₀	"
Curb stone and filling.....	0 ⁷⁹³ ₅₂₈₀	"
Grand total.....	18 ¹⁹¹⁶ ₅₂₈₀	Miles.

By reference to the following tables, it will be seen that the greater portion of the street paving for the year was done with cedar blocks, which, for a wooden pavement, gives fair satisfaction; but, as expressed in my last report (and I am still of the same opinion), only block stone pavement placed on a foundation of the Telford plan should be laid in the streets having weighty traffic, and wherever Macadam is used for an improvement the same should be laid about six inches below the regular grade.

REPORT OF STREETS IMPROVED IN THE WEST DIVISION FOR THE YEAR 1880.

STREETS.	FROM	TO	When Commenced.	When Finished.	CONTRACTOR.	NATURE OF IMPROVEMENT.	Lineal Feet.	Square Yards.
Adams str. et.	Halsted street.	Canal street.	June 6.	July 10.	J. B. Smith & Co.	8-in. Cedar, 1-in. Floor and Composition	2,092	8,800
Twenty-second st.	South terminus.	South terminus.	April 10.	April 20.	J. B. Smith & Co.	3 in. White Oak Plank.	1,035	8,800
Centre avenue.	Blue Island av.	Twenty-second st.	April 21.	not complete.	R. F. Conway	Wall and Filling.	3,639	.....
Centre avenue.	Taylor street.	Twelfth street.	August 20.	Oct. 21.	R. F. Conway	Curb and Filling.	793	.....
Clinton street.	Madison street.	Carroll avenue.	July 19.	August 10.	J. Kincaid.	8-in. Cedar, 1-in. Floor and Composition	1,780	5,347
Clinton street.	Madison street.	Carroll avenue.	August 10.	Sept. 15.	J. P. Dickey.	8-in. Cedar, 1-in. Floor and Composition	1,391	5,987
Canalport avenue.	Halsted street.	Twenty-second st.	July 28.	Sept. 8.	J. B. Smith & Co.	6-in. Cedar, 1-in. Floor and Composition	2,269	13,505
Division street.	Monroe street.	East to River.	October 3.	Nov. 30.	Ray & Whitney	8-in. Cedar, 1-in. Floor and Composition	2,184	11,296
Desplaines street.	Monroe street.	Harrison street.	October 5.	Nov. 12.	J. B. Smith & Co.	6-in. Cedar, 1-in. Floor and Composition	1,796	7,551
Elizabeth street.	Lake street.	Indiana street.	October 5.	Nov. 12.	J. B. Conway	Macadam Gravel Top.	1,178	5,253
Elizabeth street.	Lake street.	Indiana street.	Sept. 10.	not complete.	R. F. Dickey	8-in. Cedar, 1-in. Floor and Composition	1,020	7,543
Fulton street.	Clinton street.	Union street.	Sept. 10.	Sept. 26.	J. P. Dickey	8-in. Cedar, 1-in. Floor and Composition	2,712	1,259
Halsted street.	Madison street.	Harrison street.	May 25.	June 26.	J. B. Smith & Co.	6-in. Cedar, 1-in. Floor and Composition	336	1,173
Halsted street.	Indiana street.	Ohio street.	June 30.	July 9.	Ray & Whitney	6-in. Cedar, 1-in. Floor and Composition	293	.....
Washington street.	Indiana street.	Warren avenue.	May 13.	June 14.	A. Jaicks.	6-in. Cedar, 1-in. Floor and Composition	792	.....
Madison street.	Madison street.	Adams street.	Nov. 1.	not complete.	R. F. Conway	Macadam Gravel Top.	854	.....
Hoyne street.	Madison street.	Hoyne avenue.	April 27.	not complete.	R. F. McAdams & Co.	6-in. Cedar, 1-in. Floor and Composition	1,904	8,841
Jackson street.	Madison street.	Canal street.	June 29.	Sept. 1.	J. B. Smith & Co.	8-in. Cedar, 1-in. Floor and Composition	1,878	11,133
Jackson street.	Madison street.	Canal street.	July 29.	Sept. 1.	J. B. Smith & Co.	8-in. Cedar, 1-in. Floor and Composition	398	1,770
Lincoln street.	Adams street.	Jackson street.	May 31.	July 27.	J. B. Smith & Co.	6-in. Cedar, 1-in. Floor and Composition	4,333	17,000
Madison street.	Adams street.	Jackson street.	Sept. 20.	Dec. 1.	J. Kincaid.	8-in. Cedar, 1-in. Floor and Composition	1,752	7,760
Madison street.	Adams street.	Jackson street.	June 19.	August 10.	W. E. Shaw & Co.	Shaw's Patent.	1,214	3,562
Monroe street.	Oakley street.	Kelly street.	Sept. 6.	Oct. 21.	W. H. Watson.	6-in. Cedar, 1-in. Floor and Composition	795	3,562
Monroe street.	Madison street.	Louis street.	June 21.	July 6.	Ray & Whitney	6-in. Cedar, 1-in. Floor and Composition	729	3,278
Madison street.	Madison street.	Randolph street.	July 6.	Oct. 21.	R. F. Conway	6-in. Cedar, 1-in. Floor and Composition	1,492	9,049
Van Buren street.	Van Buren street.	Harrison street.	August 3.	Sept. 16.	J. B. Smith & Co.	8-in. Cedar, 1-in. Floor and Composition	1,492	9,049
Washington street.	Halsted street.	Clinton street.	August 3.	Sept. 16.	J. B. Smith & Co.	8-in. Cedar, 1-in. Floor and Composition	1,492	9,049

Total. 84,068 Miles.

135,532 Square Yards.

Streets marked thus * were improved by private contract.

REPORT OF STREETS IMPROVED IN THE SOUTH DIVISION FOR THE YEAR 1880.

STREETS.	FROM	TO	CONTRACTOR.	When Com'ed	When Finished.	NATURE OF IMPROVEMENT. PAVEMENT.	Lineal Feet.	Square Yards.
Congress street.....	State street.....	Michigan avenue.....	Jas. G. McBean	July 8.....	July 31.....	6-in. Cedar on 2-in. Floor and Comp.....	697.	3,076.51
Clark st. ex. C. C. R. Y.	Twelfth street.....	Twenty-second st.	Jas. Steele.....	July 24.....	Nov. 20.....	7-in. Cedar on 2-in. Floor and Comp.....	4,510.9	13,456.23
*Clark st. ex. C. C. R. Y.	500 ft. S. of 12th st.	1,000 ft. S. 14th st.	Jas. G. McBean for M. S. & L. S. R. R.	Sept. 16.....	Oct. 9.....	7-in. Cedar on 2-in. Floor and Comp.....	1,648.	3,804.33
*Calumet avenue.....	Twenty-first street.....	Twenty-third st.	A. J. McBean.....	Nov. 1.....	Nov. 30.....	6-in. Cedar on 2-in. Floor and Comp.....	1,023.8	4,346.04
Calumet avenue.....	Thirty-first street.....	Thirty-fifth street.....	Jas. G. McBean.....	Sept. 8.....	Unfinished.	Macadam, with Boulder Stone Gutters.....	2,597.75	.....
*Fifth av. ex. W. C. C. R. Y.	Monroe street.....	Van Buren street.....	Robt. McClelland.....	May 20.....	July 31.....	7-in. Cedar on 2-in. Floor and Comp.....	1,297.	4,316.33
*And ex. 220x16 ft. N. of N. W. cor. Adams st.	Monroe street	Adams street.....	Ray & Whitney.....	August 21.....	August 31.....	Granite Blocks on Bank Gravel.....	230.	301.11
Fifth avenue.....	Van Buren street.....	Taylor street.....	A. Jaicks.....	May 17.....	August 11.....	7-in. Cedar on 3-in. Hemlock and Comp.....	2,388.	10,399.29
Franklin street.....	Ex. l. 8, for l. 104 and Van Buren street.....	Harrison st. between Van Buren street.....	Jas. G. McBean.....	June 10.....	June 24.....	8-in. Cedar on 1-in. Pine and Comp.....	801.65	4,863.23
Harrison street.....	State street.....	Franklin street.....	J. B. Smith & Co.....	May 12.....	June 2.....	7-in. Cedar on 1-in. Hemlock and Comp.....	796.	4,308.65
Harrison street.....	State street.....	Franklin street.....	Ray & Whitney.....	June 3.....	June 10.....	8-in. Cedar on 1-in. Pine and Comp.....	929.33	4,486.73
Jackson street.....	State street.....	Dearborn street.....	Jas. G. McBean.....	June 28.....	June 10.....	8-in. Cedar on 1-in. Pine and Comp.....	886.5	2,811.59
Jackson street.....	Fifth avenue.....	Market street.....	Jas. G. McBean.....	July 2.....	August 10.....	7-in. Cedar on 1-in. Pine and Comp.....	964.	1,603.54
La Salle street.....	Van Buren street.....	Quincy street.....	Jas. G. McBean.....	Sept. 15.....	Nov. 30.....	Medium Stone on 8-in. Gravel.....	646.87	2,784.77
*Groveland Park place	Ex. intersection of S. L. Myricka add.	Thirtieth street.....	Wm. H. Stowe.....	Nov. 1.....	Nov. 18.....	6-in. Cedar, 1-in. Pine and T. S. Gravel.....	620.1	3,602.35
Michigan avenue.....	River street, ex. Randolph street.....	Randolph street.....	J. B. Smith & Co.....	July 10.....	July 20.....	8-in. Cedar on 2-in. Floor and Comp.....	1,296.74	5,616.01
Michigan avenue.....	Adams street.....	Jas. G. McBean.....	Ray & Whitney.....	June 10.....	August 15.....	7-in. Cedar on 1-in. Floor and Comp.....	2,273.47	12,432.09
Market street, E. 1/2.....	Adams place.....	40.5 ft. S. of Wash. st.	J. B. Smith & Co.....	Oct. 3.....	Oct. 10.....	7-in. Cedar on 2-in. Floor and Comp.....	139.75	4,962.25
*Market st. W. 1/2 and 440 ft. of E. 1/2.....	Calhoun place.....	Washington street.....	Ray & Whitney.....	Oct. 27.....	Nov. 6.....	Granite Stone on Bank Gravel.....	189.75	1,151.25
Randolph street.....	Wabash avenue.....	Michigan avenue.....	A. Jaicks.....	June 3.....	June 18.....	8-in. Cedar on 1-in. Floor and Comp.....	370.	1,367.34
River street.....	Except Railroad	Occupation.....	J. B. Smith & Co.....	Jan. 17.....	June 1.....	8-in. Cedar on 1-in. Floor and Comp.....	370.5	1,430.40
S. Water street.....	Michigan avenue.....	Central avenue.....	A. Jaicks.....	May 31.....	June 28.....	8-in. Cedar on 1-in. Floor and Comp.....	129.41	670.88
Sherman street.....	Van Buren street.....	Robt. McClelland.....	Ray & Whitney.....	July 12.....	Aug. 7.....	7-in. Cedar on 2-in. Floor and Comp.....	368.69	1,394.76
Taylor street.....	Clark street.....	Fifth avenue.....	Madam & Barrell.....	July 23.....	Sept. 8.....	8-in. Cedar on 1-in. Floor and Comp.....	785.	2,395.42
Twentieth street.....	State street.....	Calumet street.....	Intersections.....	August 25.....	Sept. 4.....	Re-graveling, 3-in. deep, Bank Gravel.....	1,785.	.....
Van Buren street.....	Except street	Michigan avenue.....	A. Jaicks.....	June 15.....	July 10.....	6-in. Cedar on 1-in. Floor and Comp.....	361.	1,622.36
Washington street.....	Franklin street.....	Market street.....	Ray & Whitney.....	July 10.....	July 24.....	8-in. Cedar on 1-in. Floor and Comp.....	330.	1,401.74
Total.....							28,942.46, or 5.48 Miles.	

Streets marked thus * are done by private contract.

REPORT OF STREETS IMPROVED IN THE NORTH DIVISION FOR THE YEAR 1880.

STREETS.	FROM	TO	CONTRACTOR.	When Commenced	When Finished	NATURE OF IMPROVEMENT.	Feet.	Cu. Yards.
Division street....	N. Clark street....	Lake Shore Drive.	J. B. Smith.....	May 15....	Not compl'd	6-in. Cedar, 1-in. Floor and Composition....	1,922	5,171
*Erie street.....	N. Clark street....	St. Clair street....	A. H. Perkins & Co.	Nov. 4....	Not compl'd	6-in. Cedar, 1-in. Floor and Composition....	1,412	5,453
Lincoln avenue....	Centre street....	Belden avenue....	O. Vider.....	June 8....	August 19	6-in. Cedar, 1-in. Floor and Composition....	2,674	8,594
Larrabee street....	Centre street....	Webster avenue....	J. P. Dickey.....	July 15....	August 19	6-in. Cedar, 1-in. Floor and Composition....	1,267	3,311
*Milton avenue....	Oak street....	Division street....	O. Vider.....	August 11	Sept. 12	6-in. Cedar, 1-in. Floor and Composition....	1,301	4,857
*N. State street....	Kinsie street....	Viaduct.....	W. H. Watson & Co.	July 16....	July 19	8-in. Cedar, 1-in. Floor and Composition....	211	849
North avenue....	Wells street....	North Branch....	R. McClelland....	August 25	Oct. 16	8-in. Cedar, 1-in. Floor and Composition....	5,849	36,346
*Ohio street....	N. Clark street....	St. Clair street....	W. H. Watson & Co.	May 9....	June 1	6-in. Cedar, 1-in. Floor and Composition....	2,092	8,523
*Ontario street....	N. Clark street....	St. Clair street....	A. H. Perkins.....	July 9....	July 28	6-in. Cedar, 1-in. Floor and Composition....	2,092	8,523
*Rush street.....	Illinois street....	Ohio street....	J. B. Smith.....	Sept. 11..	Sept. 17	6-in. Cedar, 1-in. Floor and Composition....	410	1,750
							18,420	73,953
STREET.	FROM	TO	CONTRACTOR.	When Commenced	When Finished	NATURE OF IMPROVEMENT.	CUBIC YDS.	REMARKS.
Clybourn ave..	North avenue..	Racine avenue.	E. F. Gobel.....	July 19....	Not compl'd	Walling and Filling...	3,431	Being 3,280 Lineal Feet. The Filling not completed.

Streets marked * indicate done by private contract.

Total number of miles, 3³⁹/₆₄.

The contract for sweeping the improved streets was awarded to Charles Walsh, on March 31st, @ \$26.50 per mile. The following table exhibits in detail the number of miles swept each month, also the total number in each Division:

STREET CLEANING, 1880.

DIVISION.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Total.
South.....	21.26	127.29	144.00	161.31	140.91	131.95	166.01	41.26	933.99
West	21.26	65.31	80.45	67.51	75.63	47.57	78.67	24.31	460.71
North	9.27	40.22	38.87	56.77	38.21	38.05	48.38	19.24	289.01
Total miles	51.79	232.82	263.32	285.59	254.75	217.57	293.06	84.81	1683.71

The following table shows in detail the number of miles of streets graded and repaired by the City Foreman:

STREETS GRADED AND REPAIRED.

	NORTH DIVISION.		SOUTH DIVISION.		WEST DIVISION.	
	Unimproved Streets Graded.	Cindered and Macadam Streets Repaired.	Unimproved Streets Graded.	Cindered and Macadam Streets Repaired.	Unimproved Streets Graded.	Cindered and Macadam Streets Repaired.
Miles... ..	62.00	2.25	51.00	1.75	271.83	5.00

The following shows the work done by the carpenters and pavers, under the head of repairs:

REPAIRS.

FOR WHAT USED.	SOUTH DIVISION.				NORTH DIVISION.				WEST DIVISION.			
	No. rep.	Sq. yds.	Lumber.		No. rep.	Sq. yds.	Lumber.		No. rep.	Sq. yds.	Lumber.	
			Pine.	Oak.			Pine.	Oak.			Pine.	Oak.
Aprons.....	350		38,271		315		8,238	22	1,056		74,412	
Street crossings.....	147		34,340	4,031	129		12,376	13,292	512		71,141	39,995
Street culverts.....	33		6,255	678	37		1,368	455	169		27,467	7,284
Alley crossings.....	158		55,454	982	73		4,068	2,216	197		13,704	8,488
Alley culverts.....			3,758		17		887	194	67		6,792	1,914
Drain boxes.....	31		3,251		3		200		39		5,621	80
Paving, gen. repairs.....		8,018				6,415				11,242		
Paving, sewer dep't.....		80								53		
Paving, water dep't.....		1,331				110				5,733		
Paving, gas company.....		75				20				631		
Paving, st. permits.....		677				836				597		
Sidewalk, gen. repairs.....			86,542	230			17,522				74,439	5,596
Sidewalk, railing.....			1,832				1,863				4,324	
Sidewalk, steps.....			1,220				3,110				3,891	
Sidewalk, intersec's.....			8,467				6,804				35,175	
General repairs.....			99,880	473							12,365	
Rep. appch. 18th st. b.....			1,786									
Planking Main street.....			52,496									
Planking, water dep't.....												34,380
Appch. to 22d st. brid.....			3,534									
Appch. Harrison st. b.....			12,876	4,000								
Appch. Kinzie st. brid.....												8,015
Appch. Chic. ave. br.....											804	10,405
Appch. Indiana st. br.....											9,348	
Appch. Clybrn. pl. br.....											1,574	
Wlks built, spl. ass't.....			7,240								5,025	
Sidewlk at Ellis Park.....			5,954									
Total.....		10,181	423,156	10,394		7,381	56,436	16,179		18,256	346,082	116,157

The following is a statement of the sidewalks constructed during the past year:

SOUTH DIVISION.

MATERIAL.	LINEAL FEET.	LENGTH IN MILES.
Pine.....	33,756	
Stone.....	1,155	6 $\frac{3231}{5280}$

WEST DIVISION.

MATERIAL.	LINEAL FEET.	LENGTH IN MILES.
Pine.....	87,643	
Stone.....	2,480	
Concrete.....	160	17 $\frac{523}{5280}$

NORTH DIVISION.

MATERIAL.	LINEAL FEET.	LENGTH IN MILES.
Pine.....	82,676	
Stone.....	4,211	
Concrete.....	677	15 $\frac{3476}{5280}$

Making a total of

Pine.....	37 ³⁸²⁷ ₅₂₈₀	miles.
Stone.....	12 ⁵⁶⁶ ₅₂₈₀	"
Concretè.....	8 ³⁷ ₅₂₈₀	"
Total.....	39 ¹⁹⁵⁰ ₅₂₈₀	miles.

Making, from actual measurement, up to date, 720⁶⁵⁰₁₀₀ miles of sidewalk built in the city.

THE PARKS.

The parks under the control of this department have been kept in as good condition as the appropriations permitted. No additional improvements have been added, the amount expended being for maintenance only.

RIVER TUNNELS.

The money expended on the Washington and La Salle street tunnels during the past year, has been for salaries of engineers, and ordinary running expenses. The pavements on the drive-ways are in almost an impassible condition, and ought to be repaved during the coming season.

The following is the report of the Street Lamp Department for the past year:

CHICAGO, February 1, 1881.

WILLIAM FOGARTY, Esq.,

Superintendent of Streets, etc.

DEAR SIR: I herewith submit my report of street lamps made and repaired for the year ending December 31st, 1880.

At the end of the year there were 11,080 lamps in the City, an addition of 198 lamps during the year (137 West Division, 31 South Division, 30 North Division) divided among the three divisions of the City as follows, to-wit:

West Division.....	5,656
South Division	3,153
North Division	2,271
	11,080

The total number of lamps repaired during the year aggregated 16,401.

The total number of lamps repaired with glass on streets amounted to 14,867.

The number of lamps on which the tin work was repaired and painted was 935.

The number of three-quarter lamps, or all new except a portion of the top, was 599.

The number of new lamps for inside of blocks was 558.

The number of corner lamps, with new street guide, was 979.

The number of lamps condemned during the year and replaced by new ones was 1,537.

The total number of lamps glazed, repaired and new, was 17,938.

The average number of lamps broken was 41 per day.

The number of "Stewart" patent lamps in the City was 3,690.

The number of lamps with the "Giroux" patent street guide was 1,152.

There was used for glazing new lamps 6,148 top lights, 1,537 door lights, 4,611 side lights of glass.

There was used for repairing or replacing in old lamps 2,944 top lights, 3,306 door lights, 9,694 side lights.

The year 1880 will be remembered as one of unusual storms, and, consequently, did great damage to the old tin lamps, as will be seen from the large number of new ones made to replace the old. About one-third of all the lamps in the city are now of

the "Stewart" patent. These are made with the socket and bottom plate cast in one piece; the corner uprights and door catch are of malleable iron; the keepers for the side glass are cast on these uprights, so that when once on the lamp post they sit as firm as the post itself. It is impossible for them to rust, and cannot be broken unless with a force that would break the post, and no wind can blow out the glass. The door is hinged with brass hinges having brass pins, and all the upper glass slide into frames. It is the only lamp I know of that can support the extra weight or leverage of the "Giroux" street sign. As soon as an old lamp is brought in where the top is good, the patent bottom is put on and strips for the top lights, also new door, and the lamp is as good as new at less expense than repairing with tin.

The City having purchased from Mr. Benj. Giroux the right to use his patent street guide, it will not be necessary to make many new inside lamps, as the old corner lamps can be moved inside and new sign lamps put on the corners, so that by the end of this year almost all the street corners where there are lamp posts will have the new street guide.

NEW LAMPS.

Cost of sign lamps	\$3,426 50
Cost of plain lamps.....	1,127 16
Cost of glass for new lamps	952 00

REPAIRING LAMPS.

Cost of three-quarter lamps.....	748 75
Cost of repairing and painting old lamps.....	748 00
Cost of glass repairing.....	1,557 00

SUNDRIES.

Gas burners for street lamps.....	128 25
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CREDIT.

Amount Special Assessment Department from sundry warrants.....	525 00
Amount for lamps made, Special Assessment Department.....	594 00
Amount appropriated for street signs.....	500 00
Amount collected to replace damage by runaway teams	77 25

Respectfully submitted,

JOHN STEWART,

In Charge Lamp Department.

Respectfully submitted,

WILLIAM FOGARTY,

Superintendent of Streets.

SPECIAL ASSESSMENT DEPARTMENT.

CHICAGO, December 31, 1880.

CHARLES S. WALLER, Esq.,

Commissioner of Public Works.

DEAR SIR: I submit herewith, in tabular form, a statement of special assessments made in this department during the past year, with a summary of the estimated cost of the same; also, a recapitulation of the number of miles of street improvement of the various kinds, the number of lamp posts in the City, and the amount of special assessments made in each year during the past twenty years.

STATEMENT OF ASSESSMENTS FOR WOODEN BLOCK PAVEMENT.

No. Warrants	NAME OF STREET.	FROM	TO	AMOUNT.
3434	North av.....	N. Clark st.....	N. Br. Chicago river.....	\$32,327 53
3438	Wood st.....	W. Van Buren st.....	W. Harrison st.....	4,540 85
3455	Lake st.....	State st.....	Michigan av.....	5,403 60
3456	Bremer st S. L.....	Oak st.....	Division st.....	1,636 72
3457	Fifth av.....	Van Buren st.....	Taylor st.....	17,249 58
3458	Jackson st.....	State st.....	Dearborn st.....	2,561 21
3459	W. Adams st.....	Canal st.....	Halsted st.....	9,322 13
3460	Halsted st.....	W. Madison st.....	W. Harrison st.....	7,293 94
3461	N. Halsted st.....	W. Indiana st.....	W. Ohio st.....	1,507 00
3462	W. Jackson st.....	Canal st.....	Halsted st.....	8,989 57
3468	N. State st.....	Kinzie st.....	Viaduct.....	1,036 32
3469	Michigan av.....	River st.....	Randolph st.....	8,654 63
3470	Market st.....	Adams st.....	Van Buren st.....	7,146 92
3471	Michigan av.....	Randolph st.....	Jackson st.....	15,953 66
3472	Franklin st.....	Adams st.....	Van Buren st.....	6,344 57
3473	Taylor st.....	Fifth av.....	Clark st.....	3,307 02
3474	Van Buren st.....	Wabash av.....	Michigan av.....	2,401 03
3479	Sherman st.....	Jackson st.....	Van Buren st.....	2,714 15
3480	Clinton st.....	W. Madison st.....	180' N. Carroll av.....	8,489 07
3481	Jefferson st.....	W. Madison st.....	125' N. Carroll av.....	14,068 88
3488	Randolph st.....	Wabash av.....	Michigan av.....	1,568 28
3502	Desplaines st.....	W. Monroe st.....	W. Harrison st.....	12,258 53
3506	Franklin st.....	Van Buren st.....	Harrison st.....	4,938 35
3507	Clark st.....	Twelfth st.....	Twenty-second st.....	15,173 09
3513	La Salle st.....	Quincy st.....	Van Buren st.....	8,561 62
3514	W. Madison st.....	Halsted st.....	Ashland av.....	20,752 52
3515	Bryan pl.....	W. Randolph st.....	W. Lake st.....	1,779 73
3524	Congress st.....	State st.....	Michigan av.....	4,734 63
3525	Clybourne av.....	North av.....	Racine av.....	29,371 23
3526	Clybourne av.....	Racine av.....	Fullerton av.....	23,422 62
3528	Jackson st.....	Fifth av.....	Market st.....	4,403 53
3535	Fulton st.....	Canal st.....	Sangamon st.....	16,098 79
3559	Division st.....	N. Clark st.....	Lake Shore Drive.....	11,312 75
3577	Market st. S. L.....	Madison st.....	Washington st.....	2,672 14
3589	Adams st.....	State st.....	Michigan av.....	4,114 34
3590	Washington st.....	Wabash av.....	Michigan av.....	1,559 91
3591	Ohio st. S. L.....	N. Clark st.....	St. Clair st.....	1,402 02
3607	W. Monroe st. S. L.....	Robey st.....	Oakley av.....	2,790 13
3608	Ontario st. S. L.....	N. Clark st.....	St. Clair st.....	2,673 99
3615	Wentworth av. S. L.....	Twenty-ninth st.....	Thirty-third st.....	3,768 37
3616	W. Monroe st. S. L.....	Loomis st.....	Ashland av.....	2,526 07
3621	Pacific av.....	Jackson st.....	Van Buren st.....	2,165 38
3633	W. Randolph st.....	Desplaines st.....	Halsted st.....	5,410 21
3635	Wood st.....	W. Lake st.....	W. Van Buren st.....	14,330 33
				\$358,526 93

STATEMENT OF ASSESSMENTS FOR MISCELLANEOUS STREET IMPROVEMENTS.

No. War-rant.	NATURE OF IMPROVEMENT.	NAME OF STREET.	FROM	TO	AMOUNT.
3467	Macadamizing	Chestnut st	Rush st.....	Pine street.....	\$3,904 77
3475	Curbing and Fil'ng	Centre ave	W. Taylor st....	W. Twelfth st...	2,458 98
3476	Macadamizing	California ave...	W. Madison st....	W. Van Buren st	3,084 90
3477	Macadamizing	Calumet ave.....	Eighteenth st...	Twentieth st....	3,461 87
3482	Macadamizing	Eighteenth st...	Indiana ave.....	Calumet ave.....	3,281 95
3501	G. and Gravel.....	W. Jackson st....	Halsted st.....	Hoyne ave.....	40,927 61
3503	Macadamizing	Twentieth st....	State st.....	Calumet ave.....	1,165 50
3504	Macadamizing	California ave...	W. Van Buren st	W. Twelfth st...	6,411 43
3509	Macadamizing	W. Jackson st...	Hoyne ave.....	Rockwell st.....	17,533 68
3505	Macadamizing	Ashland ave.....	W. Congress st...	W. Tw'ty-sec'd st	14,000 79
3516	Macadamizing	Thirty seventh st	Vincennes ave...	Grand Boulevard	7,840 12
3518	Curbing and Fil'ng	Centre ave.....	Blue Island ave..	W. Tw'ty-sec'd st	22,129 02
3521	Macadamizing	Elizabeth st....	W. Madison st....	W. Lake st.....	6,264 51
3522	Macadamizing	Eldridge ct.....	State st.....	Michigan ave....	3,891 63
3523	Macadamizing	Peck ct.....	State st.....	Michigan ave....	3,872 25
3527	Macadamizing	Robey st.....	W. Lake st.....	W. Harrison st...	17,551 50
3529	Macadamizing	Honore st.....	W. Madison st....	W. Adams st....	4,554 38
3609	Curbing and Fil'ng	Whiting st.....	N. Wells st.....	N. Market st....	4,207 76
3622	Macadamizing	Hastings st.....	Blue Island ave..	Loomis st.....	2,708 09
3626	Macadamizing	Twenty-fourth st	State st.....	S. Park ave.....	8,358 66
3632	Curbing and Fil'ng	Johnson st.....	W. Taylor st....	W. Twelfth st...	1,928 67
3634	Curbing and Fil'ng	O'Brien st.....	Jefferson st.....	Halsted st.....	1,856 01
					\$181,394 08

STATEMENT OF ASSESSMENTS FOR STREET AND ALLEY OPENINGS AND WIDENINGS.

No. War-rant	NATURE OF IMPROVEMENT.	NAME OF STREET.	FROM	TO	AMOUNT.
3463	Widening	State st.....	Twelfth st.....	Egan ave.....	\$341,610 56
3517	Opening and Wid'g	Leavitt st.....	Through.....	Sec. 31, 39, 14 ..	4,810 82
					\$346,421 38

STATEMENT OF ASSESSMENTS FOR THE ERECTION OF LAMP POSTS.

No. War-rants	No. Posts	NAME OF STREET.	FROM	TO	AMOUNT.
3444	3	Lafin st.....	W. Adams st.....	W. Jackson st.....	\$ 91 00
3447	3	W. Congress st...	Aberdeen st.....	Centre ave.....	101 50
3454	7	Lumber st.....	W. Twelfth st....	Stephenson st....	182 00
3548	1	Cass st.....	Superior st.....	Chicago ave.....	33 00
3588	4	Calumet ave.....	Eighteenth st....	400 feet south...	122 50
3592	5	W. Jackson st....	Halsted st.....	Sangamon st.....	160 00
3593	5	W. Jackson st....	Loomis st.....	Lafin st.....	160 00
3594	5	Fulton st.....	Canal st.....	Jefferson st.....	150 00
3598	1	Ada st.....	W. Lake st.....	Fulton st.....	35 00
3605	5	Hurlbut st.....	Clybourne ave...	Sigel st.....	161 65
3610	6	Grove ct.....	Larrabee st.....	Orchard st.....	168 90
3612	2	Wood st.....	W. Congress st....	W. Harrison st...	28 68
3627	24	W. Jackson st....	Leavitt st.....	Rockwell st.....	627 60
3628	17	W. Fifteenth st...	Blue Island ave..	Ashland ave.....	478 55
3631	3	Elizabeth st....	W. Randolph st...	W. Lake st.....	83 45
3636	21	Weason st.....	Chicago ave.....	Division st.....	549 15
3638	10	N. May st.....	W. Erie st.....	W. Chicago ave....	278 35
					\$3,411 33

STATEMENT OF ASSESSMENTS FOR LAYING WATER
SERVICE PIPES.

No. War- rants.	NAME OF STREET.	FROM	TO	AMOUNT.
3437	Wesson st.	Chicago ave.	Oak st.	\$ 307 65
3445	Wood st.	W. Van Buren st.	W. Harrison st.	129 00
3446	W. Washington st.	Clinton st.	Halsted st.	136 00
3449	Lincoln st.	W. Adams st.	W. Jackson st.	76 00
3450	Larrabee st.	Centre st.	Webster ave.	491 40
3451	Noble st.	W. Indiana st.	Milwaukee ave.	804 60
3452	W. Monroe st.	Seeley ave.	Oakley ave.	983 40
3497	Clark st.	Twelfth st.	Twenty-second st.	2,282 50
3498	Eighteenth st.	Indiana ave.	Calumet ave.	234 45
3499	Centre ave.	W. Taylor st.	W. Twelfth st.	374 40
3500	Calumet ave.	Eighteenth st.	Twentieth st.	494 10
3508	Ontario st.	N. Clark st.	Pine st.	461 55
3509	Chestnut st.	Rush st.	Pine st.	252 90
3510	Clinton st.	W. Madison st.	W. Kinzie st.	1,085 25
3511	Jefferson st.	W. Madison st.	W. Kinzie st.	188 00
3512	W. Jackson st.	Halsted st.	Hoyne ave.	3,555 90
3520	Centre ave.	Blue Island ave.	W. Twenty-second st.	2,028 30
3536	Michigan ave.	River st.	Jackson st.	480 00
3537	Loomis st.	W. Madison st.	W. Van Buren st.	240 30
3538	Elizabeth st.	W. Madison st.	W. Lake st.	394 25
3539	Fulton st.	Canal st.	Sangamon st.	193 95
3540	W. Adams st.	Canal st.	Hoyne ave.	1,580 00
3549	Halsted st.	W. Madison st.	W. Harrison st.	539 20
3550	Egan ave.	Cottage Grove ave.	Lake ave.	450 30
3551	Thirty-seventh st.	Vincennes ave.	Grand Boulevard.	1,258 60
3552	La Salle st.	Adams st.	Van Buren st.	190 40
3553	W. Jackson st.	Hoyne ave.	Rockwell st.	2,180 80
3554	Honore st.	W. Madison st.	W. Adams st.	196 20
3555	Robey st.	W. Lake st.	W. Harrison st.	897 25
3556	Thirty-seventh st.	Cottage Grove av.	Lake ave.	457 90
3575	Twenty-fourth st.	State st.	South Park ave.	198 00
3576	Twenty-third st.	State st.	South Park ave.	233 55
3579	Clybourne ave.	North ave.	Racine Road.	2,599 20
3580	Clybourne ave.	Racine Road.	Fullerton ave.	3,098 60
3581	Thirty-first st.	Cottage Grove ave.	South Park ave.	431 00
3582	Hubbard st.	Desplaines st.	Ashland ave.	1,631 00
3583	Wentworth ave.	Twenty-ninth st.	Thirty-first st.	1,692 00
3586	Lincoln st.	W. Jackson st.	Ogden ave.	392 10
3587	Lincoln st.	W. Adams st.	W. Indiana st.	645 40
3597	W. Division st.	Milwaukee ave.	Lincoln st.	2,148 60
3600	W. Lake st.	Canal st.	Ashland ave.	1,315 80
3601	Morgan st.	W. Madison st.	W. Harrison st.	971 70
3603	Loomis st.	W. Congress st.	W. Twelfth st.	1,681 50
3611	Division st.	State st.	Lake Shore Drive.	738 00
3617	W. Monroe st.	Loomis st.	Ashland ave.	568 00
3625	Douglas ave.	South Park ave.	East terminus.	331 25
3637	Park ave.	Ashland ave.	P. C. & St. L. R. R.	1,122 30
3639	Johnson st.	W. Taylor st.	W. Twelfth st.	203 00
				\$43,215 55

STATEMENT OF ASSESSMENT FOR LAYING PRIVATE DRAINS.

No. War- rants.	NAME OF STREET.	FROM	TO	AMOUNT.
3439	W. Adams st.....	Irving av.....	Oakley av.....	\$ 162 00
3440	Wood st.....	W. Van Buren st.....	W. Harrison st.....	48 00
3441	Noble st.....	W. Indiana st.....	Milwaukee av.....	519 75
3442	Elizabeth st.....	W. Lake st.....	W. Indiana st.....	288 00
3443	Lincoln st.....	W. Adams st.....	W. Jackson st.....	115 50
3448	Larrabee st.....	Centre st.....	Webster av.....	1,043 75
3453	W. Monroe st.....	Robey st.....	Oakley av.....	1,113 50
3483	Market st.....	Adams st.....	Van Buren st.....	357 00
3484	Eighteenth st.....	Indiana av.....	Calumet av.....	225 00
3485	Calumet ave.....	Eighteenth st.....	Twentieth st.....	739 50
3490	Peck court.....	State st.....	Michigan av.....	105 00
3491	Franklin st.....	Adams st.....	Van Buren st.....	365 50
3492	Hubbard court.....	State st.....	Michigan av.....	66 00
3493	W. Adams st.....	Robey st.....	Hoyle av.....	138 50
3494	Centre av.....	W. Taylor st.....	W. Twelfth st.....	342 00
3495	Elizabeth st.....	W. Madison st.....	W. Lake st.....	208 00
3496	W. Jackson st.....	Halsted st.....	Hoyle av.....	2,458 50
3519	Centre ave.....	Blue Island av.....	W. Twenty-second st.....	1,540 00
3530	Lincoln st.....	W. Jackson st.....	Ogden av.....	325 50
3541	Clark st.....	Twelfth st.....	Twenty-second st.....	1,296 60
3542	Honore st.....	W. Madison st.....	W. Adams st.....	332 50
3543	Lincoln st.....	W. Adams st.....	W. Chicago av.....	576 25
3544	Robey st.....	W. Lake st.....	W. Harrison st.....	1,045 00
3545	Clybourne av.....	North av.....	Racine av.....	3,105 00
3546	W. Jackson st.....	Hoyle av.....	Rockwell st.....	2,405 10
3547	Chesnut st.....	Rush st.....	Pine st.....	240 50
3578	Morgan st.....	W. Madison st.....	W. Harrison st.....	485 00
3584	Thirty-seventh st.....	Vincennes av.....	Grand Boulevard.....	1,808 50
3585	Clybourne av.....	Racine av.....	Fullerton av.....	5,006 25
3595	Ashland av.....	W. Lake st.....	Milwaukee av.....	2,725 50
3596	Thirty-seventh st.....	Cottage Grove av.....	Lake av.....	825 00
3599	Wentworth av.....	Twenty-ninth st.....	Thirty-third st.....	1,697 00
3602	Loomis st.....	W. Congress st.....	W. Twelfth st.....	1,627 50
3613	Forest av.....	Thirty first st.....	Douglas av.....	2,112 00
3614	Division st.....	N. State st.....	Lake Shore Drive.....	691 00
3618	W. Monroe st.....	Loomis st.....	Ashland av.....	373 00
3619	Ashland av.....	W. Congress st.....	W. Twelfth st.....	3,174 00
3620	Wesson st.....	Chicago av.....	Oak st.....	126 00
3623	Twenty-fifth st.....	State st.....	Prairie av.....	177 50
3624	Twenty-third st.....	State st.....	South Park av.....	118 00
3630	Egan av.....	Cottage Grove av.....	Lake av.....	1,003 25
3640	Johnson st.....	W. Taylor st.....	W. Twelfth st.....	195 00
				\$41,278 45

STATEMENT OF ASSESSMENT FOR THE CONSTRUCTION OF
SIDEWALKS.

No- War- rants	Side of Street.	NAME OF STREET.	FROM	TO	AMOUNTS.
3435	B	Forest ave.....	Thirty-first st.....	Thirty-third st.....	\$ 87 50
3436	B	W. Monroe st.....	L. S. B. 1 Rockwell....	California ave.....	313 16
3464	B	Nixon st.....	W. Polk st.....	W. Taylor st.....	67 60
3465	B	Emerald ave.....	Thirty-fourth st.....	Egan ave.....	511 92
3466	S	W. Jackson st.....	California ave.....	Washtenaw ave.....	141 35
3486	B	Dashiel st.....	Thirty-seventh st.....	Egan ave.....	210 48
3487	N	Thirty-eighth court..	Halsted st.....	Laurel st.....	83 78
3531	B	Ashland ave.....	W. Lake st.....	Bloomington Road..	1,164 13
3532	E	Paulina st.....	800' N. So. Br. River.	Blue Island ave.....	377 00
3533	N	W. Indiana st.....	Central Park av.....	Tinkham ave.....	29 35
3534	W	Tinkham ave.....	W. Indiana st.....	W. Ohio st.....	116 00
3561	B	W. Randolph st.....	Ann st.....	Ogden ave.....	58 00
3562	B	W. Randolph st.....	S. Br. Chicago River.	Morgan st.....	205 87
3563	B	Lafin st.....	W. Madison st.....	W. Twenty-second st	351 49
3564	B	Loomis st.....	W. Madison st.....	W. Twenty-second st	600 23
3565	B	Elston ave.....	Milwaukee av.....	North ave.....	256 22
3566	B	Park ave.....	Leavitt st.....	Rockwell st.....	144 00
3567	B	Fake st.....	Archer ave.....	Lyman st.....	57 60
3568	B	W. Harrison st.....	Halsted st.....	Ashland ave.....	241 25
3569	B	South Park ave.....	Twenty-second st.....	Twenty-sixth st.....	108 51
3570	B	Langley ave.....	Thirty-seventh st.....	Egan ave.....	137 27
3571	B	Aberdeen st.....	W. Harrison st.....	W. Madison st.....	263 46
3572	B	Rawson st.....	McHenry st.....	Elston ave.....	138 60
3573	B	Barber st.....	Stewart ave.....	Halsted street.....	118 58
3574	B	Clinton st.....	W. Harrison st.....	W. Twelfth st.....	268 11
3604	B	W. Fifteenth st.....	Morgan st.....	Wood st.....	344 12
3606	N	W. Madison st.....	California ave.....	Homan av.....	175 67
3629	B	Western ave.....	W. Madison st.....	W. Harrison st.....	75 60
					<u>\$6,647 78</u>

SUMMARY.

Total assessments for wooden block
pavement, including curbing and
filling:

North Division...	\$102,983 17	
South Division.....	125,386 01	
West Division.....	130,157 75	
		<u>\$358,526 93</u>

Total assessments for street and alley
openings and widenings:

South Division.....	\$341,610 56	
West Division.....	4,810 82	
		<u>346,421 38</u>

Total assessments for the erection of
lamp posts:

North Division	\$ 912 70	
South Division	122 50	
West Division	2,376 13	
		3,411 33

Total assessments for laying water
service pipes:

North Division	\$7,949 30	
South Division	7,042 05	
West Division	28,224 20	
		43,215 55

Total assessments for laying private
drains:

North Division	\$ 8,477 75	
South Division	10,290 25	
West Division	22,510 45	
		41,278 45

Total assessments for constructing
plank sidewalks:

North Division		
South Division	\$1,197 09	
West Division	5,450 69	
		6,647 78

Total assessments for miscellaneous
street and alley improvements:

North Division	\$ 8,112 53	
South Division	31,871 98	
West Division	141,409 57	
		181,394 08

\$980,895 50

Total to be paid from appropriation
fund:

North Division	\$25,223 03	
South Division	34,820 77	
West Division	79,182 12	
		139,225 92

\$1,020,121 42

Total number of lamp posts erected
by assessment:

NORTH DIVISION.

From January 1, 1880, to January 1, 1881	30	
Erected prior to January 1, 1880..	2,232	
		2,262

SOUTH DIVISION.

From January 1, 1880, to January 1, 1881	30	
Erected prior to January 1, 1880..	3,110	
		3,140

WEST DIVISION.

From January 1, 1880, to January 1, 1881	137	
Erected prior to January 1, 1880..	5,447	
		5,584

Total number erected by special assessment.....		10,986
--	--	--------

In addition to the above, there are bridge and viaduct posts, not pro- vided for by assessment, making the total number of lamp posts in the city		11,080
---	--	--------

The street improvements made during the past year, in
addition to those previously reported, gives the following

RECAPITULATION.

614,622 lineal feet of wooden block pavement, equal to	116 $\frac{2142}{5280}$ miles
5,595 lineal feet of stone pavement, equal to...	1 $\frac{315}{5280}$ miles
48,849 lineal feet of cinderling, equal to.....	91 $\frac{329}{5280}$ miles
39,056 lineal feet of graveling, equal to.....	72 $\frac{096}{5280}$ miles
44,013 lineal feet of Macadamizing, equal to...	81 $\frac{773}{5280}$ miles

Total number of miles improved in the City.	142 $\frac{2375}{5280}$ miles
---	-------------------------------

These improvements are distributed in the three divisions of the City as follows:

NORTH DIVISION.

144,710 lineal feet of wooden block pavement, equal to	27 $\frac{2150}{5280}$ miles
3,049 lineal feet of Macadamizing, equal to....	$\frac{3049}{5280}$ miles
908 lineal feet of stone pavement, equal to....	$\frac{908}{5280}$ miles
1,194 lineal feet of graveling, equal to.....	$\frac{1194}{5280}$ miles
6,666 lineal feet of cindering, equal to.....	$\frac{11386}{5280}$ miles
Total number of miles.....	29 $\frac{3407}{5280}$ miles

SOUTH DIVISION.

207,283 lineal feet of wooden block pavement, equal to	39 $\frac{1363}{5280}$ miles
3,576 lineal feet Macadamizing, equal to	$\frac{3576}{5280}$ miles
4,687 lineal feet stone pavement, equal to	$\frac{4687}{5280}$ miles
23,942 lineal feet graveling, equal to.....	$\frac{42822}{5280}$ miles
Total number of miles.....	45 $\frac{1888}{5280}$ miles

WEST DIVISION.

262,629 lineal feet wooden block pavement, equal to	49 $\frac{3909}{5280}$ miles
37,388 lineal feet Macadamizing, equal to.....	$\frac{7428}{5280}$ miles
13,920 lineal feet graveling, equal to.....	$\frac{23390}{5280}$ miles
42,183 lineal feet cindering, equal to	$\frac{75223}{5280}$ miles
Total number of miles.....	67 $\frac{2360}{5280}$ miles

The following list shows the total of assessments made in each year since 1861:

For the year ending April 1, 1862.....	\$ 42,635 49
For the year ending April 1, 1863.....	46,493 67
For the year ending April 1, 1864.....	389,169 31
For the year ending April 1, 1865.....	103,576 35

For the year ending April 1, 1866.....	802,574	56
For the year ending April 1, 1867.....	317,206	18
For the year ending April 1, 1868.....	1,354,436	48
For the year ending April 1, 1869.....	2,395,683	03
For the year ending April 1, 1870.....	2,836,852	48
For the year ending April 1, 1871.....	2,359,835	89
For the year ending April 1, 1872.....	62,222	25
For the year ending April 1, 1873.....		
For the year ending April 1, 1874.....	749,460	27
For the year ending April 1, 1875.....	723,254	42
For the nine months ending January 1, 1876....	60,585	72
For the year ending January 1, 1877.....	1,516,081	07
For the year ending January 1, 1878.....	124,498	48
For the year ending January 1, 1879.....	284,900	45
For the year ending January 1, 1880.....	588,963	43
For the year ending January 1, 1881.....	980,895	50
Total for twenty years.....	\$15,739,325	03

Respectfully submitted,

H. J. JONES,

Superintendent of Special Assessments.

These improvements are distributed in the three divisions of the City as follows:

NORTH DIVISION.

144,710 lineal feet of wooden block pavement, equal to	27 $\frac{2156}{5280}$ miles
3,049 lineal feet of Macadamizing, equal to....	$\frac{3049}{5280}$ miles
908 lineal feet of stone pavement, equal to....	$\frac{908}{5280}$ miles
1,194 lineal feet of graveling, equal to.....	$\frac{1194}{5280}$ miles
6,666 lineal feet of cindering, equal to.....	$\frac{11386}{5280}$ miles
Total number of miles.....	$29\frac{3407}{5280}$ miles

SOUTH DIVISION.

207,283 lineal feet of wooden block pavement, equal to	39 $\frac{1363}{5280}$ miles
3,576 lineal feet Macadamizing, equal to	$\frac{3576}{5280}$ miles
4,687 lineal feet stone pavement, equal to ...	$\frac{4687}{5280}$ miles
23,942 lineal feet graveling, equal to.....	$4\frac{2822}{5280}$ miles
Total number of miles.....	$45\frac{1888}{5280}$ miles

WEST DIVISION.

262,629 lineal feet wooden block pavement, equal to	49 $\frac{3909}{5280}$ miles
37,388 lineal feet Macadamizing, equal to.....	$7\frac{428}{5280}$ miles
13,920 lineal feet graveling, equal to.....	$\frac{23360}{5280}$ miles
42,183 lineal feet cindering, equal to	$7\frac{5223}{5280}$ miles
Total number of miles.....	$67\frac{2360}{5280}$ miles

The following list shows the total of assessments made in each year since 1861:

For the year ending April 1, 1862.....	\$ 42,635 49
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For the year ending January 1, 1880	588,963	43
For the year ending January 1, 1881	980,895	50
Total for twenty years.....	\$15,739,325	03

Respectfully submitted,

H. J. JONES,

Superintendent of Special Assessments.

MAP DEPARTMENT.

CHICAGO, December 31, 1880.

CHAS. S. WALLER,

Commissioner of Public Works.

DEAR SIR—I herewith present my annual report of the Map Department for the year 1880:

In the last year ninety-one new subdivisions of lands located inside the City limits have been recorded, all of which have been entered in the five different sets of atlases in use by the Department of Public Works, viz.:

Atlas of Map Department.

Atlas of Water Department.

Atlas of Special Assessment Department.

Atlas of Street Department.

Atlas for House Numbers.

The following is a list of the ordinances, passed by the City Council the last year, pertaining to the business of this office, and entered in the different atlases.

OPENINGS, WIDENINGS AND EXTENSIONS.

Opening of an alley in Block 59 of Canal Trustees' subdivision of Sec. 7, 39, 14. March 29.

Opening of Morgan street to Milwaukee avenue. April 2.

Opening of Ashland avenue south through Block 12, in Canal Trustees' subdivision of Sec. 29, 39, 14. Aug. 30.

Opening of Hinman street from Leavitt street to Hoyne avenue. Sept. 20.

Opening of Idaho street south to W. Taylor street. Nov. 12.

Opening of W. Quincy street west to Halsted street. Dec. 5.

Opening of an alley in Forsythe's Second Add. Dec. 9.

Opening of an alley in Alethean Add. Dec. 9.

Widening Thirty-seventh street from State street to Grand Boulevard. Jan. 12.

Widening Thirty-third street from Forest avenue to South Park avenue. March 1.

Widening California avenue from Madison street to Warren avenue. March 15.

Widening W. Twelfth street from Ogden avenue to West City Limits. June 11.

Extending Groveland Park avenue north to Twenty-eighth street. Feb. 16.

REPEALING ORDINANCES.

Opening Thirty-seventh street from State street to Indiana avenue. Jan. 5.

Opening Thirtieth street from Prairie avenue to South Park avenue. Feb. 5.

Opening Dearborn street from Jackson street to Fourteenth street.

VACATIONS.

Vacation of part of N. Water street and N. Franklin street, in Block 5 of Original Town. Jan. 26.

Vacation of E. 105 feet of alley in Block 3, O'Neil's Add. April 19.

Vacation of certain alleys in Blocks 11 and 12, Reaper Add. April 19.

Vacation of Lock street, east of Lot 5, Block 12, Canal Trustees' subdivision of Sec. 29, 39, 14. Aug. 30.

Vacation of alley in Sub-Block 2 of Block 4 of Moore's subdivision of E. $\frac{1}{2}$ N. W. $\frac{1}{4}$ Sec. 30, 39, 14. Sept. 20.

Vacation of part of alley in Lot 1, Block 1, George Smith's Add. Sept. 27.

Vacation of part of Depuyster street, in Block 67, School Sec. Add. Confirmed Dec. 9.

CHANGING STREET NAMES.

Pine street (that part lying west of water works) changed to Tower Place. July 12.

Barry Point Road changed to Colorado avenue. Sept. 6.

Church street changed to Hudson avenue. Dec. 9.

STREET NUMBERS.

On the first of May last the time for procuring new house numbers for that portion of the South Division lying south of Twelfth street having expired, the City Council extended the time for another month. By the first of June 7,500 new numbers (about 90%) had been given out by this Department. Since that time no record as to the amount of numbers called for has been kept. The new system has given very general satisfaction.

On a good many streets, all over the City, the house numbers are very irregularly affixed, and there ought to be some method applied to remedy this evil.

If, for instance, the Division books in the Water Department could be provided with the correct "official" house numbers, and let such numbers be marked on the receipts for water tax, the owners or occupants of houses would soon know whether they have the correct numbers or not. In this way, in the course of time, the existing irregularity would be overcome without any extra expense.

In the last annual report of this Department, it was shown that there are two streets named "Wright street," and two streets named "Union Place;" also, that several streets are known by two or three different names (see report of 1879, pages 194 and 195). This has not been changed, and the inconveniences arising therefrom still exist. I respectfully call your attention to these facts.

As the "Atlas of the Map Department" is to my knowledge the only one in existence showing all the new subdivisions, house numbers, openings or vacations of streets and alleys, with all the

necessary marginal notes as to dates, etc., complete, it is of great value. These maps have been in constant use since 1873, and some of the pages are in such a condition that in the near future it will be almost impossible to decipher some of the figures, remarks, etc., and further use will certainly not improve them. I therefore would recommend the purchase of a new set of "Peltzer's Atlas of Chicago" for this office, to be posted up with the rest of the books. To insure the future value of this new set of books, it should necessarily not be accessible to the general public as long as the old books can be used. The entire expense would only amount to sixty dollars, the purchase price of the atlas.

Besides entering the new subdivisions and noting the ordinances in the five sets of atlases, this Department has, during the last year, prepared the following number of plats and tracings for the use of the different departments, viz.:

For Special Ass'm't Dep't:

- 234 plats for sidewalk ass'm't.
- 115 plats for street improvement ass'm't.
- 24 plats for lamp post ordinances.
- 17 plats for ordinances for opening or extension of streets, etc.
- 3 plats for vacation of streets and alleys.

For Street Department:

- 14 survey maps.

For Law Department:

- 138 plats and tracings.

For Miscellaneous Purposes:

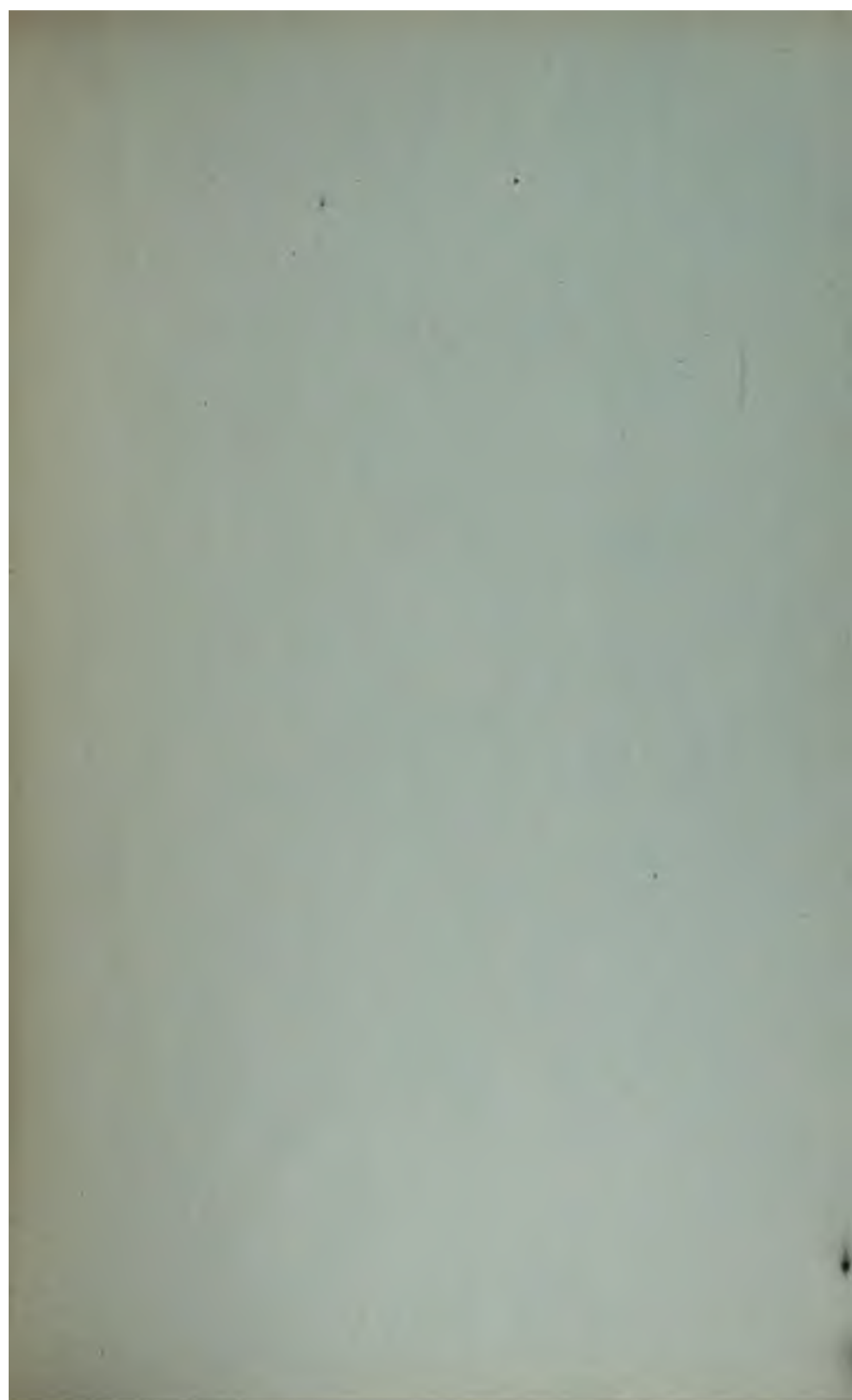
- 21 plats and tracings.

In conclusion, let me state that out of the \$3,025 appropriated for the maintenance of this Department, but \$2,826.75 has been expended, leaving the sum of \$198.25.

Respectfully submitted,

FRANCIS A. DEMMLER,

Supt. Map Department.





138285

SIXTH ANNUAL REPORT
OF THE
DEPARTMENT
OF
PUBLIC WORKS
TO THE
CITY COUNCIL OF THE CITY OF CHICAGO,
FOR THE
Fiscal Year Ending December 31, 1881.

CHICAGO:
GEO. K. HAZLITT & CO., PRINTERS, 174 CLARK STREET.
1882.

YDDA

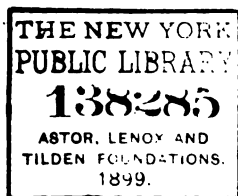


SIXTH ANNUAL REPORT
OF THE
DEPARTMENT
OF
PUBLIC WORKS

TO THE
City Council of the City of Chicago,

FOR THE FISCAL YEAR
ENDING DECEMBER 31, 1881.

CHICAGO:
GEO. K. HAZLITT & CO., PRINTERS, 174 CLARK STREET.
1882.



DEPARTMENT OF PUBLIC WORKS.

CARTER H. HARRISON, Mayor,
In Charge of Department of Public Works.

D. S. MEAD,
Secretary,

DEWITT C. CREGIER,
City Engineer.

F. C. MEYER,
Book-keeper.

WILLIAM FOGARTY, . . . SUPERINTENDENT OF STREETS.
G. HOWARD ELLERS, . . SUPERINTENDENT OF SEWERAGE DEPT.
HERMANN LIEB, . . . SUPERINTENDENT OF WATER OFFICE.
O. F. WOODFORD, ... WATER TAX ASSESSOR.
JOHN HISE, ... CASHIER.
J. K. TINNY, ... REGISTRAR.
H. J. JONES, ... SUP'T SPECIAL ASSESSMENT DEPT.
FRANCIS A. DEMMLER, . . . SUP'T OF MAP DEPARTMENT.

COMMISSIONER'S REPORT.

OFFICE OF THE DEPARTMENT OF PUBLIC WORKS,
CHICAGO, May 1, 1882.

To the Honorable City Council of the City of Chicago:

GENTLEMEN: I submit herewith the Sixth Annual Report of the Department of Public Works for the year ending December 31st, 1881.

Charles S. Waller having resigned the position of Commissioner of Public Works October 19th, 1881, the Mayor on that date assumed the management and control of said Department. The City Council by an ordinance passed October 31st, 1881, legalized the acts of the Mayor in the performance of the duties of such Commissioner.

The work performed under the direction and supervision of this department during the year 1881, is presented in the following condensed tables, to-wit:

STREET WORK.

Streets paved and improved:

Cedar Blocks.....	17.86 miles
Pine Blocks.....	0.34 "
Macadam	6.14 "
Medina Stone.....	0.58 "
Asphalt Blocks.....	0.07 "
Curbing and Filling.....	0.74 "
Total.....	25.73 "

There were built and relaid during the past year about 137.70 miles of sidewalk; of this amount 128.60 miles was constructed of wood, and 9.10 miles of stone and concrete.

STREET CLEANING.

Eleven hundred and twenty-three miles of improved streets were cleaned during the year 1881, distributed as follows:

In South Division.....	668 miles.
In West Division.....	275 "
In North Division.....	180 "
Making	1,123 "

In the repairs at intersections of streets, for aprons, street and alley crossings, culverts, drain boxes, etc., and for other general repairs in the street department, the quantity of lumber used, as shown by the report of the Superintendent of Streets, was as follows:

Of Pine.....	969,876 feet.
Of Oak.....	223,864 "
Total	1,193,740 "

The whole amount expended during the year 1881 for street repairs and cleaning was as follows:

In South Division.....	\$ 69,219 67
In West Division.....	75,786 36
In North Division.....	27,852 04
Total.....	\$172,858 07

GAS LAMPS.

At the close of the year 1881, the whole number of street lamps in the City was 11,344, distributed as follows:

COMMISSIONER'S REPORT.

7

In West Division.....	5,852
In South Division.....	3,171
In North Division.....	2,321
Total.....	11,344

The whole number of oil lamps erected during the year was 574.

The whole number of street lamps repaired during the year was 19,375, as follows:

Repaired with glass.....	18,220
Tin work repaired and painted.....	798
Three-fourths of lamp made new.....	357
Total.....	19,375

The average breakage was 50 per day.

There were 849 new lamps put in between corners and 449 new corner lamps put in with street gudes. The number of lamps condemned during the year and replaced by new ones was 1,298.

The whole expense of the Street Lamp Department for the year 1881 for materials and labor, including lamp posts, was \$12,290.47.

The lighting of the city cost in 1881 as follows:

Chicago Gas Company's Bill.....	\$127,443 64
People's Gas Company's Bill.....	157,051 84
Total	\$284,495 48

WATER WORKS.

The whole quantity of water pipe of various sizes laid during the year 1881 is 19 $\frac{333}{888}$ miles.

The whole number of hydrants put in during the year is. 252
The whole number of stop-cocks put in during the year is. 134

The whole number of new meters put in during the year is 178
 The whole number of water engines connected to elevators
 during the past year is 66.

At the Pumping Works, North Side (4 engines), the total quantity of water pumped during the year 1881 was 13,758,940,879 gallons. The daily average was about $37\frac{1}{2}$ millions of gallons. Nearly 4 millions per day more than in 1880. During the month of October, 1881, the daily average was nearly $43\frac{1}{2}$ millions.

At the Pumping Works, West Side (2 engines), the total quantity of water pumped during the year 1881 was 9,572,845,000 gallons. The daily average was $28\frac{1}{2}$ million gallons.

The total quantity of water pumped at both North and West Works during the year 1881 was 23,331,785,879 gallons. An average of nearly 64 millions per day; and during the month of August the daily average was nearly 72 million.

COAL USED.

	POUNDS.
At North Pumping Works during the year 1881.	23,664,550
General average per day.....	64,834
At West Pumping Works during the year 1881..	9,847,460
General average per day.....	26,980
The expense due to pumping at North Pumping Works for the year 1881 was.....	\$98,004 25
For maintenance and repairs of Pumping Works, etc.....	8,431 40
Total expense	\$106,435.65
The expense due to pumping at West Pumping Works for the year 1881 was.....	\$ 50,260 96
For maintenance and repairs of Pumping Works, etc.....	3,137 93
Total expense	\$ 53,398 89

The cost of pumping the water at North Pumping Works for past eleven years has been as follows:

In 1871, per million gallons.....	\$11 31
" 1872, " " "	12 02
" 1873, " " "	11 64
" 1874, " " "	12 86
" 1875, " " "	10 81
" 1876, " " "	9 56
" 1877, " " "	7 09
" 1878, " " "	6 24
" 1879, " " "	5 65
" 1880, " " "	5 68
" 1881, " " "	7 12

The cost of pumping the water at the West Pumping Works since commencement has been as follows:

In 1877, per million gallons.....	\$6 66
" 1878, " " "	5 45
" 1879, " " "	5 02
" 1880, " " "	5 15
" 1881, " " "	5 25

The entire cost of the whole water system of the city up to December 31, 1881, was \$8,979,523 27, as follows:

Whole cost May 6, 1861, when Board of Public Works was organized.....	\$1,020,160 21
Less transferred to North Pumping Works account, for cost of two engines and \$5,000 for cost of lot	88,500 00
Leaving.....	\$ 931,660 21
Cost of Water Pipe laid since 1861.....	\$5,136,479 97
Cost of North Pumping Works.....	807,249 44
Cost of West Pumping Works.....	510,619 46
Cost of Lake Tunnel.....	464,866 05
Cost of Second Lake Tunnel.....	415,709 36
Am't carried forward.....	\$7,334,924 28

Am't brought forward.....	\$7,334,924 28
Cost of Land Tunnel, extension of Lake Tunnel to West Pumping Works.....	542,912 63
Cost of Lake Tunnel Crib.....	70,253 31
Cost of New Shore Inlet.....	42,871 17
Cost of West Reservoir.....	1,702 87
Cost of Water Works Shops.....	25,551 73
Cost of Water Works Stock.....	29,318 00
Cost of advertising for new engines at West Pumping Works.....	329 07

Total.....\$8,979,523 27

Total income from Water Rents to December 31, 1881.....	\$12,137,080 68
Total operating expense and maintenance to De- cember 31, 1881, including interest on the bonded debt and bonds canceled.....	10,016,981 03

Surplus of income over operating expenses and
maintenance.....\$ 2,120,099 65

BONDS.

Water Loan Bonds, 7 per cent., outstanding De- cember 31, 1881.....	\$ 3,625,000 00
Water Loan Bonds, 6 per cent., outstanding De- cember 31, 1881.....	330,000 00

Total unpaid Water Loan Bonds.....\$ 3,955,000 00

Net balance to credit of the Water Fund, De-
cember 31, 1881.... \$ 393,149 86

The following table exhibits the amount of water furnished, and the revenue per million gallons received annually, by the City, from the year 1858 to 1880 inclusive

YEAR.	MILLION GALLONS FURNISHED.	REVENUE.	REVENUE PER MILLION GALLONS.
1858.....	1,092.....	\$102,178 85.....	\$93 57
1859.....	1,415.....	122,753 50.....	86 70
1860.....	1,717.....	131,162 73.....	76 39
1861.....	1,766.....	131,035 10.....	74 15
1862 (fifteen months).	2,705.....	188,448 25.....	85 00
1863.....	2,336.....	192,246 39.....	82 29
1864.....	2,523.....	224,902 57.....	89 14
1865.....	2,778.....	253,114 49.....	91 11
1866.....	3,169.....	302,017 59.....	95 30
1867.....	4,232.....	338,929 28.....	80 08
1868.....	5,375.....	420,686 94.....	78 26
1869.....	6,801.....	476,968 24.....	70 13
1870.....	7,945.....	539,180 19.....	67 86
1871.....	8,423.....	445,834 64.....	52 93
1872.....	10,051.....	544,465 90.....	54 17
1873.....	11,723.....	708,804 32.....	60 46
1874.....	13,903.....	705,926 64.....	50 77
1875 (nine months)...	10,957.....	635,996 54.....	58 04
1876.....	15,346.....	771,940 38.....	50 30
1877.....	19,047.....	908,509 64.....	47 70
1878.....	19,564.....	944,190 97.....	48 31
1879.....	20,557.....	922,001 26.....	44 85
1880.....	21,002.....	865,618 35.....	41 21
1881.....	23,331.....	936,922 07.....	40 16

RECEIPTS.

For current rents collected.....	\$ 936,802 14
On Water Service Cocks account.....	25,767 26
“ Water Works repairs account.....	6,271 89
“ Water Pipe extension account.....	6,128 30
“ Water Meters account.....	39,397 02
“ North Pumping Works account.....	191 78
Am't carried forward.....	<u>\$1,014,558 39</u>

Am't brought forward.....	\$1,014,558 39
On West Pumping Works account....	173 00
“ Water Works Shops account.....	762 13
Miscellaneous receipts.....	11,029 63
Total	<u>\$1,026,523 15</u>

EXPENDITURES.

For Water Pipe extension.....	\$ 181,570 50
“ North Pumping Works.....	106,435 65
“ West Pumping Works.....	53,398 89
“ Water Meters	48,619 23
“ Lake Tunnel Crib.....	22,716 01
“ Water Works repairs.....	51,153 06
“ Water Works Shops.....	3,361 47
“ Water Works Stables.....	114 30
“ Pumping Lake Tunnel.....	455 56
“ Water Service Cocks.....	23,219 11
“ Fire Cisterns.....	436 12
“ New Engines West Pumping Works	329 07
“ Water Loan Interest.....	274,133 12
“ Water Office Expenses	2,737 98
“ Water Proportional Office expense.....	776 38
“ Water Office salaries.....	58,322 86
“ Water Proportional salaries.....	6,720 82
“ Iron Roof North Pumping Works.....	50 88
“ Taxes refunded	948 04
“ Miscellaneous expenses	4,888 50
Total.....	<u>\$ 840,387 55</u>

SEWERS.

The whole amount of the sewerage constructed or put in during the year 1881, was something over 25 miles, as follows:

In West Division.....	17. ²⁹⁶ ₁₀₀₀ miles.
“ South “	5. ⁶¹¹ ₁₀₀₀ “
“ North “	2. ¹⁰⁷ ₁₀₀₀ “
Total	<u>25.⁰¹⁴₁₀₀₀ “</u>

Cost of constructing the same, as follows:

In West Division.....	\$230,168 07
“ South “	70,170 24
“ North “	39,101 39
Total	\$339,439 70

There was paid out for repairs of sewers during the year 1881, as follows:

In South Division.....	\$1,996 27
“ West “	3,741 88
“ North “	692 30
Total	\$6,430 45

And for cleaning sewers, as follows:

In South Division.....	\$15,981 63
“ West “	12,891 44
“ North “	5,629 08
Total	\$34,502 15

Number of catch basins built in 1881.....	548
Number of man-holes built in 1881.....	917

Whole number in the city, December 31, 1881:

Catch basins.....	10,610
Man-holes.....	12,870

Whole number of miles of sewerage in the city, December 31, 1881.....	362. ~~266~~ ₁₀₀₀
---	-------------------------------------

BONDS.

Sewerage-Loan Bonds outstanding December 31, 1881:

7% Bonds.....	\$2,133,000 00
~~4~~ ⁵ % “	490,000 00
Total	\$2,623,000 00

COST OF SEWERS.

North Division, to December 31, 1881.....	\$1,122,688	50
South Division, " " "	1,566,639	20
West Division " " "	2,974,709	00
Total.....	\$5,664,036	70

NEW CITY HALL.

Building operations upon the new City Hall have been progressing during the past year as rapidly as circumstances would allow.

Work was commenced for the year about the end of March, and during the season all the stone and brick work has been completed, and the building roofed in. The fire-proofing and interior iron work, for which contracts have been let, are progressing satisfactorily. Contracts have also been let for the steam heating, elevators and plumbing work, upon which work is now going rapidly forward. Other contracts for the interior finish will be let during the coming season, with a view to having the building completed and ready for occupancy early in the Spring of 1884.

The amount expended in the work of erecting the new City Hall, during the year 1881, was...\$228,627 92

BRIDGES AND VIADUCTS.

The amount expended for repairs, and for reconstruction of bridges and viaducts, during the year 1881, was as follows:

General repairs of bridges, at the expense of the City.....	\$56,007	40
General repairs, paid for by vessel owners and others, on account of damages done by them.....	4,757	93
General repairs of Viaducts.....	16,579	75
Cost of reconstructing South Halsted Street Viaduct.....	17,685	73
Total.....	\$95,030	81

PARKS.

The amounts expended on the various small parks under control of this department, during the year 1881, were for maintenance, including the salaries of keepers and pay of laborers, as follows:

Washington Square.....	\$ 997 96
Ellis Park.....	550 00
Lake Park.....	1,719 28
Union Park.....	2,102 37
Jefferson Park.....	1,214 60
Vernon Park.....	1,009 12
Wicker Park.....	771 55
Douglas Monument Square.....	500 00
Oak Park.....	55 50
Total.....	\$8,920 38

CONCLUSION.

The sums appropriated by the City Council for the construction and maintenance of the various improvements under the supervision of this department, for the past year, although inadequate to meet all the wants of the City, have been as far as possible judiciously and economically expended, making such improvements and doing such work only as was indispensable to provide for the immediate necessities of the public.

Before closing this report, there is a recommendation I desire to make to your honorable body. It has reference to the improvement of the residence streets of the city.

It goes almost without the saying that the greatness of Chicago has always been a fruitful theme for speakers and writers. Its marvelous growth, its expansive business and its unrivaled enterprise have often been set forth in glowing terms, and yet her people delight on all fitting occasions to dwell upon what she has been, what she now is, and what she will be among the cities of the Union. But in all the encomiums

passed upon her, it is the material, the commercial and the social advancement that seems to receive the greatest share of attention. Some allusions are made as to her æsthetical progress, the steps that have been taken to make her a beautiful city, but the possibilities of making her still grander and placing her ahead of all other cities in all that pleases the eye are not held steadily and uniformly in view.

The spirit of our citizens in public matters runs largely into the useful with incidental reference only to the ornamental. We build palatial residences, erect handsome business blocks and project great enterprises, but we give only passing attention to the elaboration and extension of our system of parks and boulevards. Beyond all these, however, there is a wide field for improvement, and it has occurred to me that some steps ought to be taken to realize to the fullest extent the adornments that can be made on the residence streets of our city.

A striking feature of these streets is their width, and yet the largest portion of it has been turned over into roadways, whose capacity for accommodating vehicles will never be fully taxed unless they should become business streets. Now what a grand improvement it would have been had these roadways been made considerably narrower and the space between the curb and the sidewalks utilized for parkways, where trees could have been planted and fine grass plats cultivated. There are very many streets in the residence portion of Chicago today that are barren and unsightly in appearance, and all made so in deference to the utilitarian spirit of giving all to the road and little to the sidewalk. True, there are numerous thoroughfares that have been beautified by lines of stately trees, but the cramped condition in which they are placed largely robs them of their pleasing effect. Not only that, but many of the trees are either stunted in growth or dead because of the want of sufficient soil to bring them to a full maturity and to majestic proportions. They are placed too near the sidewalk and curb for the want of more space, and, after growing for a time, they either lose their growth or die, to be removed

for fresher sprigs. When they were put into the earth, the only system pursued was to give so many feet to the roadway and so many to the sidewalk, little or no consideration being given to what could be done in the line of tree adornments. This system is still followed, but it is yet time to make a change. The city is continually improving and repairing its streets, and will continue to do so as long as the present style of pavements are in vogue, and hence we can yet improve upon old methods and inaugurate in the residence portion of the city a system of parkways for all these thoroughfares.

Besides adding greatly to the appearance of the streets; there are other substantial advantages to be gained by a change. One would be the great reduction in the expense of improving the streets. In streets one hundred feet in width, present ordinances give fifty feet for roadway and fifty for sidewalk. In streets eighty feet wide, forty-eight feet are given to the roadway, and, in sixty-six foot streets, thirty-eight feet go to the roadway. Thirty feet, I believe, would be ample width for roadway in all the residence streets, that width allowing easily four teams abreast. Of the remaining feet, let six or eight feet go to parkways. There would then be a saving of two-fifths of the cost of paving in the first named streets, nearly two-fifths in the second and over one-fifth in the last. This saving would be directly to the owner of the abutting lots. In addition to this there would be a large annual saving to the general tax-payer in the lessened cost of keeping in repair and cleaning the same. All these items foot up to a very large amount in a very few years, and could be very materially cut down, where the roadways are made narrower, and the parkways between sidewalk and curb proportionately made wider. But this is the least benefit to be looked for. Roadways, with their more or less filthy surface, are unsightly to the eye, and exhale from their broad surfaces noxious vapors and disagreeable odors. Their surfaces being lessened, they would be more easily and more effectually cleaned; would offer a more pleasing appearance to the eye,

and would be less offensive to the other senses. Grass plats would take the place of horse droppings, and sightly trees would grow where too often are only seen piles of garbage. Trees are among the most effective hygienic agencies; absorbing deleterious carbonic acid gases and giving out life sustaining oxygen.

Trees require an earth surface nearly equal to the spread of their branches. Placed close to a paved street on one side and a flagged sidewalk on the other, they cannot grow. But in parkways from ten to thirty feet wide, healthy and beautiful trees would grow, giving shade in warm weather, and aiding to promote health at all seasons. They would add to the beauty of the streets and the value of the abutting lot, whose owner while asleep would have his wealth increased by the nightly growth.

Another advantage would be in the protection afforded by these parkways against the spread of fires. The trees on each side of the roadway would prove a most formidable barrier against a conflagration or fire leaping across the streets to other buildings. This feature is so apparent that I need not dwell upon it.

But how, it may be asked, is this change to be effected in streets already improved? It can be done by commencing with the ends or sections still unimproved, by bringing them down to a width sufficient to admit of the laying out of a parkway, and continuing the narrowing process along the street whenever the necessity arises for repairing the other parts of it. The cost of putting in new curb stones would be trifling compared with the benefits and savings in the long run, and in some instances the owners of abutting property would gladly make the change at their own expense. Thus in time the improvement can be easily carried through along the thoroughfares in the outlying sections of the city. It is not expected that the whole length of a street can be changed in three or five years. A system such as contemplated has reference to

the future appearance of the city, and great projects require years of realization. Commencing at the earliest practicable moment, our city can be made to "blossom like a rose" in the future years. The beauty of Washington City is largely due to the magnificent elms and maples that line its streets, and every year adds to their number, there being over 2,000 trees set out last year. In some foreign cities their magnificent appearance is due to the trees, and the improvements are being continually kept up.

In view of the importance of this matter, I would therefore recommend to your honorable body that you adopt some resolution calling upon the Department of Public Works to prepare and submit some plan to carry out the foregoing suggestions.

The following reports from officers in charge of sub-departments show in detail the work which has been accomplished during the past year, and I earnestly recommend it to the examination of those interested in the progress and growth of the city.

Respectfully,

CARTER H. HARRISON, Mayor,
In Charge of Department of Public Works.

CITY ENGINEER'S REPORT.

DEPARTMENT OF PUBLIC WORKS, CHICAGO.

Hon. Carter H. Harrison, Mayor,

In charge of Department of Public Works.

SIR: I present herewith the Sixth Annual Report of the operations of the "Engineer Department," for the year ending December 31st, 1881:

WATER SUPPLY.

The total net quantity of water delivered to the city during the year is 23,331,785,879 gallons, being about eleven per cent. more than the quantity delivered during the year 1880.

The daily average for the past year was 63,922,700 gallons, a fraction over $6\frac{1}{2}$ million gallons in excess of the average for the year 1880.

The greatest daily average quantity of water used for a single month during the past year was in August, being nearly 72 million gallons. While the least daily average for a like period was in December, the quantity being a trifle less than 58 million gallons.

The greatest quantity of water used for a single day was on the 17th of September, reaching 78 millions, although the rate for several hours during this day marked as high as 83 million gallons.

The least quantity pumped in a single day during the past year was 51 million gallons, on Sunday, May 1st.

The annexed tabulated statements exhibit in detail the operations of the machinery of both the North and West Pumping Works, during the year 1881:

OPERATIONS OF BOTH PUMPING WORKS COMBINED.

MONTH. 1881.	No. of Days.	H. No. of hours run per month.	H. Average No. of hours run per day.	Total Revolutions per month.	Average No. of rev- olutions per day.	Total No. of Gal- lons water pump- ed per month, less 5% per cent. for loss of action.	Average No. Gal- lons of water pumped per day, less 5% per cent. for loss of action.	Pounds of coal con- sumed per month for pumping.	Average No. pounds of coal consumed per day for pump- ing.	Pounds of coal con- sumed per month for changing boll- ers.	Total pounds coal consumed per month.	Average head against pumps, in feet.	DUTY.
January	31	744:00	24:00	1,612,306	52,006	2,045,483,094	65,983,325	3,109,500	100,306	7,400	3,116,900	94.2	53,109,214
February	28	672:00	24:00	1,427,553	50,984	1,872,130,080	66,861,788	2,888,970	101,391	13,500	2,852,470	99.6	54,090,193
March	31	744:00	24:00	1,481,710	47,798	1,950,668,691	62,924,796	2,925,530	94,372	14,600	2,940,130	95.5	54,603,548
April	30	720:00	24:00	1,362,664	45,422	1,802,701,896	60,090,063	2,678,190	89,273	9,600	2,687,790	96.4	55,550,090
May	31	744:00	24:00	2,005,976	64,709	1,807,887,027	58,318,936	2,680,590	86,470	10,200	2,690,790	94.5	55,323,265
June	30	720:00	24:00	1,614,536	53,814	1,870,242,288	62,341,409	2,832,290	94,410	13,300	2,845,590	99.4	57,661,312
July	31	744:00	24:00	1,754,438	56,595	2,148,595,588	69,309,537	3,173,380	102,367	8,300	3,181,680	100.3	59,995,125
August	31	744:00	24:00	1,808,975	60,282	2,231,316,996	71,977,967	3,030,820	97,768	7,500	3,038,320	98.2	60,000,000
September	30	720:00	24:00	1,783,653	59,455	2,080,423,152	69,347,438	2,358,640	78,621	8,300	2,366,940	103.3	60,000,000
October	31	744:00	24:00	1,519,503	49,013	1,923,812,991	62,058,483	2,563,850	82,688	6,000	2,569,850	97.7	60,000,000
November	30	720:00	24:00	1,399,275	46,645	1,801,799,714	60,059,990	2,571,030	85,701	8,800	2,579,830	101.6	60,000,000
December	31	744:00	24:00	1,372,574	44,276	1,796,724,362	57,958,849	2,749,720	88,700	10,300	2,760,020	95.7	60,000,000
Totals	365	8,760:00	24:00	19,203,163	52,611	23,331,785,879	779,335,120	33,512,010	117,800	33,629,810	97.9	60,000,000	
General Average Per Month.		730:00		1,600,263		1,944,315,406		2,792,667		9,816	2,802,484		60,000,000
General Average Per Day.						63,922,700			91,813	322	92,135		60,000,000

NOTE.—Coal for heating building and pumping out wells included in above amounts.

*Shavings burned at West Pumping Works.

ENGINEER'S REPORT.

TABLE SHOWING TOTAL QUANTITY OF WATER PUMPED BY BOTH PUMPING WORKS COMBINED;
TOGETHER WITH ANNUAL AND DAILY INCREASE IN QUANTITY AND RATE PER CENT.; ALSO, THE GREATEST DAILY AVERAGE FOR
A SINGLE MONTH, FOR THE FOLLOWING YEARS:

YEAR.	TOTAL QUANTITY PUMPED, GALLONS.	ANNUAL INCREASE, GALLONS.	AVERAGE DAILY QUANTITY PUMPED, GALLONS.	AVERAGE DAILY INCREASE, GALLONS.	PER CENT OF ANNUAL INCREASE.	GREATEST DAILY AVERAGE.	
						MONTH.	GALLONS.
1876	15,346,922,158	-----	41,981,481	-----	-----	December.....	47,068,724
1877	19,047,104,686	3,700,182,478	52,183,892	10,252,411	24.45	July	55,912,850
1878	19,564,288,232	517,183,596	53,600,789	1,416,397	2.71	August	61,520,762
1879	20,557,080,961	993,402,749	56,822,441.	2,721,652	5.07	January	64,022,571
1880	21,002,681,905	444,990,924	57,384,376	1,061,935	2.16	July	61,355,495
1881	23,331,785,979	2,329,103,974	63,922,700	6,538,324	11.09	August	71,977,967

The quantity of water pumped and the cost of same for the past two years were as follows:

YEAR.	PUMPING.		COST.	
	TOTAL NO. GALLONS.	DAILY AVE'GE.	TOTAL COST.	AV. PER MIL- LION GALS.
1880	21,002,681,905	57,384,376	\$114,704.12	\$5.46 $\frac{13}{100}$
1881	23,331,785,879	63,922,700	148,155.03	6.34 $\frac{98}{100}$
Increase..	2,329,103,974	6,538,324	\$ 33,450.91	0.88 $\frac{85}{100}$

The annexed diagram illustrates the daily quantity of water pumped, at the North and West Works respectively, and the total quantity at both works combined:

THE TWENTY-NINTH ANNUAL REPORT OF THE OPERATIONS OF THE NORTH PUMPING WORKS

is as follows: The total amount of water pumped at these works during the past year was 13,758,940,879 gallons, being a little over eleven per cent. in excess of the quantity pumped during the year 1880. The daily average was about $37\frac{1}{2}$ million gallons, nearly four millions more than in 1880.

The greatest daily average pumped, for a single month, was in October, viz., $43\frac{1}{2}$ million gallons. The least daily average for a like period, was during May, viz., 31 million gallons.

The following tabulated record exhibits in detail the operations of the pumping machinery of the North Works for the year 1881.

THE NEW YORK
PUBLIC LIBRARY

ASTOR, LENOX AND
TILDEN FOUNDATIONS.

DIAGRAM

REVENUE

ANNUAL

THE NEW YORK
PUBLIC LIBRARY

ASTOR, LENOX AND
TILDEN FOUNDATIONS

OPERATIONS OF ENGINES AND BOILERS AT THE NORTH PUMPING WORKS.

MONTH. 1880.	No. of Days.	No. of Hours run per Month.		Average No. of Hours run per Day.	Total Revolutions per Month.	Average No. of Revolutions per Day.	Total No. of Gals. of Water pumped per Month, less 5½ per cent. for loss of action.	Average No. of Gals. of Water pumped per day, less 5½ per cent. for loss of action.	Pounds of Coal consumed per Month for pumping.	Average No. of lbs. of Coal consumed per day for pumping.	Pounds of Coal consumed per Month for changing boilers.	Total pounds of coal consumed per month.	Average head against pumps in feet.	DUTY.
		H.	M.											
January.....	31	744:00	24:00		727,136	23,456	1,160,313,094	37,429,454	1,951,500	63,351	3,000	1,954,500	98	48,595,750
February.....	28	672:00	24:00		626,667	22,381	1,071,244,080	38,258,717	1,881,070	63,395	7,600	1,888,670	100.6	49,084,852
March.....	31	744:00	24:00		615,164	19,844	1,084,122,691	34,971,700	1,838,130	59,294	8,200	1,846,330	102.3	50,320,347
April.....	30	720:00	24:00		565,364	18,845	1,005,401,896	33,513,396	1,671,790	55,726	4,400	1,676,190	102.7	51,476,639
May.....	31	744:00	24:00		1,160,404	37,432	902,315,027	31,042,420	1,684,190	54,329	5,200	1,689,390	100.04	48,577,672
June.....	30	719:55	23:59		801,582	26,719	1,057,288,282	35,242,943	1,881,890	61,063	7,900	1,889,790	106.6	51,311,803
July.....	31	744:00	24:00		878,100	28,323	1,272,257,588	41,040,567	2,151,380	69,400	5,100	2,156,480	110.6	54,548,250
August.....	31	744:00	24:00		976,817	31,510	1,339,158,996	43,198,677	2,295,220	74,039	5,700	2,300,920	109.6	53,331,579
September.....	30	720:00	24:00		940,077	31,336	1,236,847,152	41,228,238	2,191,080	73,036	5,700	2,196,780	112.6	53,010,510
October.....	31	744:00	24:00		894,036	30,323	1,314,345,991	43,366,000	2,375,350	76,624	6,000	2,381,350	114.7	54,139,317
November.....	30	720:00	24:00		824,596	27,486	1,227,120,714	40,904,024	2,092,430	69,747	6,000	2,098,430	113.4	55,464,507
December.....	31	744:00	24:00		574,375	18,528	998,525,362	32,210,485	1,750,520	56,468	5,900	1,756,420	97.4	46,335,810
TOTALS.....	365	8,750:55			9,630,318		13,758,940,879		23,664,550		70,700	23,735,250	105.78	51,290,689
General Average Per Month.....		729:50			802,526		1,140,578,406		1,972,046		5,899	1,977,937		
General Average Per Day.....		23:59			26,384		37,695,728		64,834		193	65,028		

NOTE.—Coal for heating building and pumping out wells included in above amounts.

The annexed table sets forth the total quantity of water pumped, and the time run by the several engines respectively:

Engines designated as	Hours and Minutes.		Total revolutions	Total Gals. of Water pumped, less 5% per cent. for loss of action.
	H.	M.		
1853.....	1,685	13	1,053,551	515,609,267
1857.....	1,970	32	1,248,430	960,991,478
1867.....	4,802	25	3,219,187	3,058,843,696
1872.....	7,810	5	4,109,150	9,223,496,438
Total	16,268	15	9,630,318	13,758,940,879

The south or "72" engines have pumped over two-thirds of all the water delivered from these works, and over one-third the entire quantity used by the city.

FUEL.

Coal has been received and used as follows:

LACKAWANNA COAL.

	Tons.		Pounds.	
On hand January 1, 1881.....	886		1,590	
Received.....	11,774		80	
	Tons.		Pounds.	
Used for pumping, heating building, etc.....	11,832		550	
Used for work shop.....	59		1,450	
On hand January 1, 1882.....	768		1,670	
Total.....	12,660	1,670	12,660	1,670

LAUREL HILL COAL.

	Tons.		Pounds.	
On hand January 1, 1881.....	1		1,830	
Received.....	228		1,270	
	Tons.		Pounds.	
Used for changing boilers.....	35		700	
Used for workshop, pipe extension, etc.....	165		460	
Used for pumping Lake Tunnel.....	18		1,580	
On hand January 1, 1882.....	11		360	
Total.....	230	1,100	2,300	1,100

EXPENSES DUE TO PUMPING.

Salaries of engineers.....	\$ 5,025 03
Labor, firemen, etc.....	15,285 09
11,832 $\frac{5.50}{2000}$ tons of Lackawanna coal, at an average cost of \$6.18 per ton.....	73,152 40
556 $\frac{1}{2}$ gallons of lard oil.....	504 59
338 $\frac{1}{2}$ gallons of cylinder oil.....	338 50
38 $\frac{3}{4}$ pounds of lubricating compound.....	14 74
164 pounds of tallow.....	18 95
1,433 pounds of waste.....	160 52
538 $\frac{1}{2}$ pounds of packing.....	217 05
Small stores.....	100 86
Gas for lighting works.....	1,152 34
Repairs of fire room tools.....	51 16
Repairs of engines and boilers.....	1,983 02
Total.....	<u>\$98,004 25</u>

Cost of delivering water per million gallons.....	7 12 $\frac{20}{100}$
Cost of delivering water per million gallons, one foot high.....	06 $\frac{73}{100}$
Cost of repairs of engines and boilers.....	16

Distributed as follows:

To engines.....	09 $\frac{17}{100}$
To boilers.....	06 $\frac{82}{100}$

The following is the cost of delivering water per million gallons, during the past ten years, and cost of coal:

	AVERAGE COST OF COAL PER TON.	COST PER MILL. GALS.
1873.....	\$7 18	\$11 64
1874.....	8 56	12 86
1874-5.....	8 27	12 26
1875 (nine months only).....	7 93	10 81
1876.....	7 15	9 56
Am't carried forward.....	<u>39 09</u>	<u>57 13</u>

	AVERAGE COST OF COAL PER TON.	COST PER MIL. GALS.
Am't brought forward.....	39 09	57 13
1877.....	5 38	7 09
1878 (estimated, screenings used).....	4 39	6 24
1879	4 14	5 65
1880	4 83	5 68
1881	6 18	7 12
	\$6 40	\$ 8 89

The quantity pumped each month for the past ten years is as follows:

TABLE SHOWING THE QUANTITY OF WATER PUMPED AT THE "NORTH PUMPING WORKS," EACH MONTH DURING PAST, TEN YEARS.

MONTH.	1872-73	1873-74.	1874-75.	1875.	MONTH.	1876.	1877.	1878.	1879.	1880.	1881.
April.....	696,411,320	916,329,315	969,285,640	1,243,827,877	January....	1,398,668,563	719,462,285	898,314,968	1,128,741,694	987,419,633	1,100,313,094
May.....	758,630,288	951,625,686	1,044,115,222	1,256,605,053	February....	1,169,388,859	774,594,448	815,398,987	983,647,626	906,653,592	1,071,244,080
June.....	748,928,470	936,614,148	1,010,002,323	1,163,985,505	March.....	1,244,271,298	1,088,521,780	906,047,019	1,083,257,148	978,890,272	1,084,122,691
July.....	876,306,981	1,000,695,844	1,297,543,064	1,259,434,124	April.....	1,189,825,063	1,109,008,815	586,000,942	677,241,146	974,805,659	1,005,401,896
August.....	852,976,814	1,033,164,846	1,322,546,047	1,272,876,226	May.....	1,306,577,131	1,154,372,813	639,630,064	781,082,231	1,000,443,267	962,315,027
September.	842,068,858	973,690,925	1,346,442,004	1,199,570,888	June.....	1,227,317,437	1,110,876,865	724,020,984	735,459,026	1,086,446,318	1,057,288,288
October....	843,791,259	1,018,923,312	1,151,106,735	1,227,568,188	July.....	1,358,762,909	1,113,259,814	1,114,216,563	1,046,815,119	1,122,356,346	1,272,257,585
November..	823,879,447	1,023,653,854	1,036,221,056	1,160,694,177	August.....	1,276,699,544	1,066,176,419	1,122,492,614	1,069,289,439	1,093,773,964	1,239,128,996
December..	877,853,981	1,036,250,398	1,140,296,743	1,192,680,258	September.	1,343,745,890	1,012,658,086	1,050,831,650	989,337,876	1,080,682,710	1,256,847,152
January....	906,391,154	955,646,383	1,133,462,490	1,193,462,490*	October....	1,268,071,044	998,713,776	1,064,588,733	1,047,124,558	1,038,422,722	1,244,345,991
February..	838,244,790	884,813,392	1,136,965,231	1,136,965,231*	November..	1,015,851,277	909,774,581	1,145,355,795	786,223,037	982,329,141	1,227,120,714
March.....	976,053,777	1,020,041,259	1,355,230,536	1,255,230,536*	December..	869,799,283	890,607,884	1,078,271,910	794,884,281	1,065,582,401	998,525,362
Totals....	10,050,939,189	11,722,819,032	13,903,197,493	14,642,930,253	Totals....	14,535,858,798	11,968,977,646	11,145,370,232	11,153,102,981	12,354,008,905	13,728,940,879

*These three months' figures were borrowed from the previous year (the commencement of the municipal year having been changed). In order to make up twelve months' work. They exceed the actual quantity pumped by 63,338,537 gallons, but it being leap year, there were twenty-nine days in February, besides which the new pumping works were in operation.

TABLE SHOWING TOTAL QUANTITY OF WATER PUMPED AT THE NORTH PUMPING WORKS, TOGETHER
WITH ANNUAL AND DAILY INCREASE IN QUANTITY, AND RATE PER CENT.
ALSO THE GREATEST DAILY AVERAGE FOR A SINGLE MONTH, FOR THE FOLLOWING YEARS.

YEAR ENDING	Total Quantity Pumped. GALLONS.	Annual Increase. GALLONS.	Average Daily Quantity Pumped. GALLONS.	Average Daily Increase. GALLONS.	Per Cent. of Annual Increase.	GREATEST DAILY AVERAGE.	
						MONTH.	GALLONS.
December 31, 1858.....	1,091,865,459	-----	2,991,413	-----	-----	September.....	3,617,818
" 31, 1859.....	1,415,147,910	323,282,453	3,877,119	855,706	29.61	October.....	4,565,388
" 31, 1860.....	1,716,786,552	301,338,642	4,703,525	826,406	21.31	July.....	5,367,569
" 31, 1861.....	1,767,154,689	50,368,137	4,841,520	137,995	2.93	August.....	5,438,790
March " 31, 1862.....	2,217,279,739	450,125,050	6,074,739	1,233,219	25.47	July.....	6,748,899
" 31, 1863.....	2,336,108,454	118,128,715	6,400,298	325,559	5.35	January.....	6,770,483
" 31, 1864.....	2,523,339,218	187,230,764	6,913,259	512,961	8.01	August.....	8,293,850
" 31, 1865.....	2,777,817,349	254,478,131	7,610,459	697,300	10.08	September.....	8,871,530
" 31, 1866.....	3,168,769,609	390,943,260	8,681,536	1,071,077	14.07	July.....	10,023,164
" 31, 1867.....	4,231,791,659	1,063,031,050	11,562,273	2,800,737	33.18	March.....	12,455,113
" 31, 1868.....	5,374,624,576	1,142,832,917	14,734,999	3,162,726	27.35	March.....	16,414,460
" 31, 1869.....	6,801,146,720	1,426,522,144	18,633,278	3,908,279	26.54	July.....	20,680,014
" 31, 1870.....	7,944,684,840	1,143,538,120	21,766,260	3,133,082	16.81	August.....	25,712,989
" 31, 1871.....	8,423,890,966	479,206,486	23,464,877	1,698,617	7.80	August.....	28,000,000
" 31, 1872.....	10,050,939,189	1,627,048,223	27,536,819	4,071,942	17.35	March.....	31,485,670
" 31, 1873.....	11,722,819,032	1,671,879,843	32,117,312	4,580,493	16.63	November.....	34,121,128
" 31, 1874.....	13,903,197,493	2,180,378,461	38,090,953	5,973,640	18.60	March.....	43,717,404
December 31, 1875.....	10,957,252,996	* 739,722,760	39,844,556	1,753,604	4.60	April.....	41,461,262
" 31, 1876.....	14,525,858,798	-----	39,688,138	-----	-----	August.....	44,408,695
" 31, 1877.....	11,958,977,646	-----	32,764,323	-----	-----	+ May.....	37,237,833
" 31, 1878.....	11,145,370,232	-----	30,635,261	-----	-----	November.....	38,178,526
" 31, 1879.....	11,153,102,951	-----	30,556,446	-----	-----	January.....	36,733,003
" 31, 1880.....	12,354,008,905	-----	33,754,122	-----	-----	June.....	36,214,977
" 31, 1881.....	13,758,940,879	-----	37,695,728	-----	-----	October.....	43,366,000

* Compared with the same months of the year before.

+ Exclusive of quantity pumped by the "West Works."

The following is a statement of the work done at the

MACHINE SHOPS.

located on the premises of the North pumping works.

Hydrants, stop-valves, etc., have been manufactured during the year as follows:

NEW HYDRANTS.

Four-inch, (double nozzle).....	67
Two-and-a-half-inch, (double nozzle).....	134
Two-and-a-half-inch, (single nozzle).....	40
Total manufactured.....	241
All of these have been put in use.	

NEW STOP VALVES.

Four-inch.....	72
Six-inch.....	157
Eight-inch.....	50
Twelve-inch.....	10
Sixteen-inch.....	1
Twenty-four-inch.....	2
Total manufactured.....	292
Of this number there have been used.....	275
Leaving on hand January 1st, 1882.....	17

Of the following sizes, viz.:

Four-inch.....	1
Six-inch.....	4
Eight-inch.....	7
Twelve-inch.....	2
Sixteen-inch.....	1
Twenty-four-inch.....	2
Total.....	17

The above list includes the hydrants and valves reported on hand January 1st, 1881, which were carried over as "stock" on hand.

In addition to the foregoing work, a number of hydrants and stop-valves have been repaired, and the usual amount of repairing has been done for the various departments of the city.

The total expenditures for labor and material on account of shops, including value of stock on hand, January 1st, 1882, is.....\$ 25,169.04

Charged to the following accounts, viz.:

Water department, "pumping,".....	\$ 2,197.70	
Water department, (other than pumping)	1,301.62	
New hydrants and stop-valves.....	13,185.95	
Pipe extension.....	310.66	
Tapping department.....	104.83	
Meter department.....	889.92	
Street department.....	52.09	
Fullerton avenue conduit.....	213.51	
Bridge department.....	28.88	
North Park avenue sewer.....	13.30	
River improvement fund.....	12.56	
La Salle street tunnel.....	.73	
Fire department, (coal etc.).....	603.61	
Expenses running shops, coal, gas, etc.,	1,535.98	
Stock on hand January 1st, 1882.....	4,717.70	
	\$25,169.04	\$25,169.04

The value of the work done in the shop, estimating the same at less than cur- rent prices for like articles, is.....	30,794.44
Am't carried forward.....	\$30,794.44

Am't brought forward,.....	\$30,794.44	
Add coal, attendance, etc., used by fire department.....	603.61	
Deduct cost as shown.....	\$25,169.04	
Deduct 10 per cent. for interest and de- preciation of tools, etc., costing \$7,439.61.....	743.96	
Leaving the nominal net earnings of the shop.....	5,485.05	
Total.....	\$31,398.05	\$31,398.05
Cost of tools previously reported.....	7,264.62	
Added by repairs, past year.....	174.99	
Present value of tools.....	\$ 7,439.61	
Value of stop-valves and hydrants, be- fore noted, as on hand January 1st, 1892, together with the raw material in the shop, is.....	4,717.70	
Total value of stock and tools,..	\$12,157.31	

THE OPERATIONS OF NORTH WORKS

have not been interrupted during the year from any cause.

The pumping machinery is in good order.

The buildings, grounds, etc., are in as good condition as at date of last report. The joints of stone work of tower and main buildings have been pointed and a few stones reset. The asphalt paving in front of main buildings, which is badly out of repair, will be renewed at an early day.

Assistant Engineers Trautmann, Horner and Belton have been faithful and efficient in the discharge of their duties. A. D. Howell, an employee of the works, met with a serious accident, in March last, by which he lost a portion of his right

hand. John Kelly, who had been employed at the works continuously for twenty-seven years, died on the 29th of July last.

On the 14th of June last a visitor to the water tower jumped from the top of that structure, a distance of 152 feet from the ground, and was of course instantly killed. A like case occurred a few years since, under similar circumstances. Both instances were doubtless intentional suicides, as the cupola at the top of the tower is amply secured against an accident of the kind.

WEST PUMPING WORKS.

The following report of the operation of these works is presented by the engineer in charge:

WEST PUMPING WORKS,
CHICAGO, ILL., Feb. 10th, 1882.

D. C. CREGIER, Esq.,
City Engineer.

SIR: The sixth annual report of the operations of these works, being for the year ending December 31st, 1881, is herewith submitted:

ENGINES.

Both engines have worked in a very satisfactory manner, having been in constant operation from January, 1880, until October 11th, 1881, at which time they were stopped alternately for eighteen days for the necessary repairs. Eight new pump valves were put in, and the H. P. steam cylinder valve stems being somewhat worn, were cased with brass. All other parts were found to be in as good a condition as could be expected. The head of water during the year has been eight (8) feet less than during 1880, ten feet less than during 1879, sixteen feet less than 1878, and nineteen feet less than 1877. The number of

gallons of water pumped, hours run, and cost per million, with the head each year, is shown in the following table:

Year.	Hours Run.	Revolutions.	Gal'ns Pump'd.	Head.	Cost per Million	Cost of Coal per ton.	Cost p'r million, one ft. high.
	H. M.						
1877	6,108.45	7,088,127	7,088,127,000	109	6 66	5 22	.06 11-100
1878	7,354.52	8,418,918	8,418,918,000	106	5 45	3 67	.05 14-100
1879	8,760.00	9,404,588	9,404,588,000	101	5 02	2 62	.04 98-100
1880	8,784.00	8,648,673	8,648,673,000	98 3-10	5 15	3 60	.05 24-100
1881	8,218.00	9,572,845	9,572,845,000	90	5 25	3 60	.05 83-100

For the past three years these works have been run to their full capacity, and the new engines for these works will not be completed before at least one of them will be seriously needed to supply this constantly increasing demand.

BOILERS.

During the year the boilers have required but slight repairs, and have worked very satisfactory.

GROUNDS AND BUILDINGS.

During the year I have had a new plank road built from Ashland avenue to the west side of the building, for hauling purposes, the old road being destroyed by the Chicago, Burlington & Quincy Railroad taking possession of that portion of the grounds. Also a new coal shed has been built.

The following table shows the total quantity of water pumped and the time run by the two engines respectively:

Engines designated as	Hours and Minutes	Total Revolutions.	Total Gals of Water Pumped 5% per cent. off for loss of action.
No. 25.....	8,216.00	4,783,998	4,783,998,000
No. 26	8,220.00	4,788,847	4,788,847,000
Totals.....	16,436.00	9,572,845	9,572,845,000

The West Works pumped over two and half millions more per day, or about ten per cent. more in the aggregate, than during last year.

FUEL.

Coal has been received and used as follows:

SOFT COAL.

	Tons.	Pounds.
On hand Jan. 1st, 1881.....	99	1,960
Received of Pittsburgh Nut Coal.....	5,010	1,308
Received of Laurel Hill Coal.....	128	50
Received of Gaston, West Virginia, Coal.....	131	.....
Received of Piedmont Coal.....	42	600
	Tons.	Pounds.
Used for pumping, heating build- ing, etc.....	4,923	1,460
Used for changing boilers.....	23	1,100
On hand Jan. 1st, 1882.....	464	1,358
Total.....	5,411	1,918 5,411 1,918

EXPENSES DUE TO PUMPING.

Salaries of engineers, firemen, etc.....	\$24,196 94
747½ gallons of lard oil.....	651 48
701½ gallons of cylinder oil.....	701 50
733 pounds of lubricating compound.....	219 90
1,525 pounds of waste.....	192 77
346 pounds of tallow.....	39 74
4,923½ tons of coal.....	18,126 08
Packing.....	357 67
Repairs of fire room tools.....	102 88
Repairs of engines.....	866 20
Repairs of boilers.....	223 98
Eight barrels fire clay.....	24 00
2,000 fire brick.....	90 85
Fire tile.....	42 00
New pump valves.....	648 80
Small stores.....	265 07
Steam pipe and fittings.....	123 12
Gas for lighting works.....	1,517 60
Am't carried forward.....	\$48,390 58

ENGINEER'S REPORT.

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Am't brought forward.....	\$48,390 58
Teaming.....	37 36
Lime and sand.....	90
Alterations of boilers for using shavings.....	713 81
Sundries.....	1,118 31

Total.....\$50,260 96

Cost of delivering water per million gallons.....	\$5 25 $\frac{8}{100}$
Cost of delivering water per million gallons, one foot high.....	05 $\frac{83}{100}$
Cost of repairs of engines and boilers.....	11 $\frac{38}{100}$

Distributed as follows:

To engines.....	08 $\frac{44}{100}$
To boilers.....	02 $\frac{28}{100}$

The following is the cost of delivering water per million gallons during the past five years, and cost of coal:

	Average Cost of Coal per ton.	Cost per million gals.
1877.....	\$5 22	\$6 66
1878 (estimated, screenings used).....	3 67	5 45
1879 (estimated, screenings used).....	2 62	5 02
1880.....	3 60	5 15
1881.....	3 60	5 25
	<u>\$3 74</u>	<u>\$5 50</u>

COMPARISON OF ECONOMY OF COAL AND SHAVINGS.

1881. MONTHS.	Gals. of water pumped.	Coal usually required.	Coal used with shavings.	Coal saved in pounds.	Coal saved in tons.	Cost per ton.	Gross saving.	Cost of extra help to handle shavings.	Net gain.	Usual cost of coal per million gallons.	Cost per million with shavings.
August.....	892,158,000	1,067,431	735,600	331,831	165-91	\$3.60	\$ 507.28	\$ 198.69	\$ 398.29	\$ 2.15	\$ 1.71
September.....	843,576,000	1,094,286	107,560	926,726	463-36	"	1,668.10	607.63	1,060.48	2.34	1.07
October.....	579,467,000	660,801	188,000	472,801	236-40	"	851.04	376.00	475.04	2.06	1.33
November.....	574,679,000	636,301	478,000	216,301	108-45	"	390.42	333.25	57.17	2.21	2.08
December.....	184,690,000	242,893	187,000	55,893	28--	"	100.08	61.25	39.55	2.36	2.15
TOTALS.....	3,074,570,000	3,760,912	1,756,760	2,004,152	1,002-12		3,607.64	1,577.11	2,030.53	Average 2.22	1.65

SUMMARY.

Net gain as per statement.....	\$3,030.53
Cost of machinery and sheet iron work..	745.65
Clear saving to the City.....	1,284.88

NOTE.—The use of shavings was begun on the 10th day of August, and ended on 8th of December.

From the 10th of August until the 8th of December of this year, pine shavings have been used in two, and sometimes three boilers, according to the supply, which was limited when cold weather set in.

In the early part of the year experiments were made in the use of shavings for fuel at these works, the result was satisfactory to the city, as the accompanying tabulated statement will show. When the works are run entirely with shavings about fifty-five tons per day will be required.

Engineers Stewart, Hill and Commons, as well as all others employed at these works, have been faithful in the discharge of their respective duties.

Respectfully submitted,

HENRY MASON, Engineer.

The following table presents some interesting statistics of the past, present and future, in connection with the water supply of the city.

Tabular Statement of the Consumption and Waste of Water, Relative Pumping Capacity, Population, Pipes, Revenue, Etc.

YEAR.	WATER DISTRIBUTED DAILY IN U. S. GALLONS.										REVENUE.		TAPS.		PIPE.		Population.							
	ACTUAL SUPPLY.	Per cent. of increase.	Estimated at one-sixth Annual Increase.	Estimate made in 1851 based on 35 Galls. per Inhabitant.	Quantity to each inhabitant.	Per Cent. of increase.	Average quantity per Mile of Pipe.	Per Cent. of increase.	Cap'ty of Works per Mile of Pipe.	Average quantity for each Tap.	Quantity for One Dollar per year.	Capacity of Works.	Prop'r'n of pumping capacity to quantity supplied.	Amount Collected.	Per Cent. of increase.	Number of Taps in use.		Per Cent. of increase.	No. of inhabitants to each tap.	Miles of Pipe laid.	Miles of Pipe in Use.	Per Cent. of increase.	No. of inhabitants per Mile of Pipe.	Total Number.	Per Cent. of increase.
1858	2,991,413	...	2,340,000	32.8	...	...	41,317	...	276,243	641,985.29	30,000,000	30,000,000	1 to 5.0	\$102,179	...	4,696	...	19.5	...	73.4	...	1,257	91,000	...
1859	3,877,119	29.61	3,489,980	22,530,000	43.0	...	45,559	10.56	295,017	705,315.53	30,000,000	30,000,000	1 to 5.0	132,948	30.32	5,511	18.10	12.7	85.1	73.4	17.54	1,257	91,000	...
1860	4,765,525	23.31	4,071,644	22,700,000	43.0	...	51,087	13.45	319,880	740,325.86	30,000,000	30,000,000	1 to 4.2	131,162	6.68	6,520	15.32	17.2	5.9	91.0	6.89	1,301	103,300	30.06
1861	4,841,530	2.03	4,750,251	22,880,000	43.9	...	50,803	11.71	309,853	704,352.31	30,000,000	30,000,000	1 to 4.1	150,290	14.58	6,876	8.28	...	4.3	95.3	4.72	1,317	138,186	36.47
1862	6,074,739	25.47	5,541,960	33,000,000	43.9	...	52,401	13.96	190,657	815,405.25	30,000,000	30,000,000	1 to 3.2	150,920	0.41	7,450	8.34	18.5	9.6	104.9	10.07	1,317	138,186	36.47
1863	6,400,298	5.35	6,405,630	33,400,000	40.8	...	53,899	2.40	157,109	701,300.87	30,000,000	30,000,000	1 to 3.1	190,896	36.48	8,412	12.91	...	10.5	115.4	10.00	1,317	138,186	36.47
1864	6,912,350	8.01	7,543,223	33,400,000	40.8	...	54,306	12.00	157,109	701,300.87	30,000,000	30,000,000	1 to 3.1	292,441	17.47	9,855	15.73	17.1	11.9	127.3	10.31	1,360	169,353	32.55
1865	7,610,459	10.08	8,800,427	33,400,000	43.3	...	57,040	5.82	131,416	667,380.14	30,000,000	30,000,000	1 to 2.6	301,124	12.57	11,406	15.73	...	13.9	141.2	10.91	1,360	178,492	...
1866	8,081,536	14.07	10,297,165	33,780,000	43.3	...	61,145	15.36	114,416	701,341.24	30,000,000	30,000,000	1 to 2.3	337,468	12.06	16,498	21.00	...	32.6	173.8	14.84	1,316	200,418	18.34
1867	11,262,273	38.18	11,978,359	33,960,000	58.4	...	77,070	10.63	188,460	704,341.76	38,000,000	38,000,000	1 to 2.6	476,968	34.65	20,015	36.77	11.7	33.8	249.6	15.33	1,308	222,034	55.76
1868	14,724,999	31.13	16,303,878	4,330,000	58.4	...	77,070	10.63	188,460	704,341.76	38,000,000	38,000,000	1 to 2.6	476,968	34.65	20,015	36.77	11.7	33.8	249.6	15.33	1,308	222,034	55.76
1869	18,053,278	22.53	18,303,878	4,330,000	58.4	...	77,070	10.63	188,460	704,341.76	38,000,000	38,000,000	1 to 2.6	476,968	34.65	20,015	36.77	11.7	33.8	249.6	15.33	1,308	222,034	55.76
1870	21,706,290	16.81	19,021,191	4,330,000	72.8	...	81,508	2.85	139,475	616,403.55	38,000,000	38,000,000	1 to 1.7	543,914	17.20	23,811	17.92	8.2	32.5	272.4	13.13	1,066	268,710	18.56
1871	25,464,877	17.35	25,880,054	5,004,000	74.5	...	88,005	8.62	132,272	648,503.62	38,000,000	38,000,000	1 to 1.6	539,318	13.07	35,313	34.74	8.2	32.5	272.4	13.13	1,066	268,710	18.56
1872	27,526,819	16.63	30,204,947	5,256,000	74.5	...	91,387	3.74	121,562	609,452.31	38,000,000	38,000,000	1 to 1.3	539,318	13.07	35,313	34.74	8.2	32.5	272.4	13.13	1,066	268,710	18.56
1873	32,117,312	16.63	30,204,947	5,256,000	96.3	...	98,079	7.87	101,511	739,53.94	74,000,000	74,000,000	1 to 1.8	705,959	0.41	51,263	12.30	...	40.6	351.4	13.08	1,188	300,283	53.63
1874	38,004,556	18.00	35,250,104	5,544,000	96.3	...	98,079	7.87	101,511	739,53.94	74,000,000	74,000,000	1 to 1.8	705,959	0.41	51,263	12.30	...	40.6	351.4	13.08	1,188	300,283	53.63
1875	41,031,481	7.89	47,964,357	5,852,000	105.0	...	105,0	7.00	100,700	723,703.42	74,000,000	74,000,000	1 to 1.7	831,555	17.79	57,130	3.32	7.1	6.4	416.4	1.56	977	407,000	2.85
1876	41,031,481	...	47,964,357	5,852,000	105.0	...	105,0	7.00	100,700	723,703.42	74,000,000	74,000,000	1 to 1.7	831,555	17.79	57,130	3.32	7.1	6.4	416.4	1.56	977	407,000	2.85
1877	52,183,892	24.45	55,068,393	...	122.7	...	122,878	22.02	244,500	801,567.77	104,000,000	104,000,000	1 to 2.0	944,190	8.52	59,369	3.91	7.1	8.2	491.6	1.96	1,016	430,731	7.30
1878	53,000,780	2.71	65,284,794	...	122.7	...	122,878	22.02	244,500	801,567.77	104,000,000	104,000,000	1 to 2.0	944,190	8.52	59,369	3.91	7.1	8.2	491.6	1.96	1,016	430,731	7.30
1879	56,322,441	5.07	76,165,590	...	113.7	...	127,651	1.46	251,000	880,617.65	104,000,000	104,000,000	1 to 1.9	944,190	8.52	59,369	3.91	7.1	8.2	491.6	1.96	1,016	430,731	7.30
Average for 21 years.	15.33	...	...	...	...	...	15.67	...	...	...	...	...	...	122,011	2.34	63,510	3.46	7.5	11.4	441.3	3.07	1,075	474,400	...

The following estimate for the next five years is based on the result of the past twenty-one years, as shown above.

1880	58,361,532	114.9	...	...	...	...	128,266	...	226,428	887,61.34	104,000,000	1 to 1.7	961,051	...	66,312	...	7.7	17.6	458.9	...	1,115	512,060	17.36
1881	57,284,376	2.16	...	...	...	...	128,266	...	226,428	887,61.34	104,000,000	1 to 1.7	961,051	...	66,312	...	7.7	17.6	458.9	...	1,115	512,060	17.36
1882	60,400,063	...	...	...	...	...	128,266	...	226,428	887,61.34	104,000,000	1 to 1.8	890,369	6.07	67,949	7.00	7.5	14.1	465.4	...	1,124	526,220	...
1883	63,922,700	11.09	...	...	...	...	128,266	...	226,428	887,61.34	104,000,000	1 to 1.6	1,036,802	8.88	73,627	8.35	7.5	10.9	472.3	3.07	1,177	600,420	17.36
1884	63,922,700	...	...	...	...	...	128,266	...	226,428	887,61.34	104,000,000	1 to 1.6	1,036,802	8.88	73,627	8.35	7.5	10.9	472.3	3.07	1,177	600,420	17.36
1885	66,478,880	...	...	...	...	...	128,266	...	226,428	887,61.34	104,000,000	1 to 1.5	1,078,131	...	74,718	...	9.0	17.6	520.5	...	1,388	704,080	17.36
1886	66,478,880	...	...	...	...	...	128,266	...	226,428	887,61.34	104,000,000	1 to 1.5	1,078,131	...	74,718	...	9.0	17.6	520.5	...	1,388	704,080	17.36

*—Municipal year changed from April 1st to January 1st. The figures are for nine months only.
 †—A trifle over two per cent. of this quantity was used by water engines.
 ‡—Decrease. §—Estimated.

CONSUMPTION OF WATER.

The foregoing tables show the increase in the consumption of water the past year, which is greater with one exception (1877) than for any year since 1874. The ratio of increase in the quantity of pipe laid, and the number of new house services attached, during the past year, is also greater than for any year during the period above noted. The demand for the extension of the pipe system, and the consequent large increase in the consumption of water, constitute substantial and reliable evidence, not only of a rapidly increasing population, but also that the manufacturing industries and other large consumers, are also rapidly multiplying within the limits of the water supply.

THE QUALITY OF WATER.

During the spring and winter the lake was at times very roily, due largely to the movement of ice which at many points had grounded on the bottom, and in the breaking up of the immense field which covered the lake for miles, in more or less shallow water, carried with it quantities of clay. While the water was in this roily condition, and during a flood current in the river, many specimens of water were taken at the surface and at various depths at different points from the entrance to harbor, to one to two miles north and east of the crib. The water was analyzed and the report of the chemist shows the specimens taken in the vicinity of and at the crib to be practically free from impurities. In many cases of complaint, in regard to the quality of water, it has been found that the water was drawn from a pipe without circulation, usually called a "dead end," which may have been allowed to go too long without flushing, a process that immediately corrects the water. Dead fish are occasionally a source of annoyance, especially at elevator engines. Care is taken to exclude fish by fine screens over the inlet openings at the crib, but small fish will sometimes find their way in the tunnel and pump wells, after sojourning at these points for a time, they become larger, are caught in the pumps and forced

into the pipes, and in time reach some elevator supply, after such a journey the fish is quite likely to be DEAD.

THE SUPPLY

during the year has been uniform and ample in quantity, although at times during the hours of the day of greatest consumption, the head or pressure has not been sufficient to meet the demands of the upper stories of the highest buildings, although at such times, nearly the entire pumping machinery was in operation. But since as shown by the tables, the consumption of water reaches 115 gallons per day or nearly 10 gallons per hour for 12 hours each day, for every man, woman and child in our city, estimating the population at 556,000, the occasional insufficiency of head is unavoidable with the present pumping capacity. It is hoped, however, that this feature of the water supply will be improved after the

ADDITIONAL PUMPING ENGINES

are put in operation at the West pumping station. The contract for two additional engines, with a combined daily capacity of 30 million gallons, was awarded to N. F. Palmer, Jr. & Co., New York, in January last, and is to be completed in July, 1883. The machinery is nearly an exact counterpart of that now in use at the West Works, such changes to be made in its construction as the experience of the past six years with the present engines suggests as improvements. The necessity for increased pumping capacity at this time was long since anticipated by those in charge, and the subject has been referred to in the annual reports for several years past. To meet the demands of the city, the new engines should now be in operation, but more than a year must elapse before they will be completed, in the mean time the city is growing, the pipe system being extended, and the aggregate consumption of water increasing, it is not probable therefore that with the present facilities, the head can be increased during the next year beyond that of the past year.

Notwithstanding the two engines now in course of construction will add about 30 per cent. to the pumping power, past experience justifies a reiteration of the recommendation, made in a former report, viz., that the two old single engines now at the North Works, which have been in use, one 29 and the other 24 years, should in the near future be removed, and on the valuable site occupied by them, engines of at least double the capacity should be erected. This or some other plan for increasing the supply of water will be found necessary within the next five years, in order to meet the rapid growth of the city.

HIGH SERVICE.

With the exceptions before noted the pressure of water maintained in the pipes has generally been sufficient to meet ordinary demands, and this feature of the water supply will be improved as soon as the additional pumping machinery now building is completed, but even then the pressure that will be ample for most purposes will not be adequate to reach the upper stories of the highest buildings, and also meet the demands of hydraulic elevator engines, most of which are located in the principal section of the city, bounded by the river, Michigan avenue, Van Buren street and the South Branch. To provide for these purposes it is proposed to make this section of the city an independent water district, by shutting off from the general pipe system the distribution pipes now laid within the limits named, and by means of an auxiliary pumping station located on the river at Monroe or Washington streets, pump from the Water Tunnel contiguous to these points, and supply such independent district with water under sufficiently high pressure to meet the special local requirements. Such an arrangement would have the effect of giving greater capacity to the main pumping works for supplying the balance of the city under ordinary pressure for general purposes. A report upon the proposed change was recently submitted to the City Council, and the subject is still under consideration by that body.

PIPE EXTENSION.

During the past year $19\frac{3}{8}\frac{2}{8}\frac{3}{8}$ miles of pipe have been laid, $2\frac{5}{8}\frac{9}{8}\frac{0}{8}$ miles of 4-inch pipe have been taken up, and other pipe, mostly 6 and 8-inch, have been laid in its place; 3,260 lineal feet of pipe of various sizes have been abandoned; a portion of this pipe is under the substructures and approaches of viaducts, and at other points, rendering the cost of its removal greater than the value of the pipe.

The most important work of the season was the continuation of the 36-inch main on Blue Island avenue, from Fifteenth street southward, from where the work of laying was suspended last season. This line of main was laid from Fifteenth street, on Blue Island avenue, to Rebecca street; thence west to Loomis street; thence south to Blue Island avenue; thence southwest on the latter avenue to Ashland avenue; thence to the tower at the West Pumping Station. A 12-inch main was laid on Milwaukee avenue from Chicago avenue to Union street, connection being made with the 16-inch main on the latter street. This line of pipe is principally for fire service. It serves double 4-inch nozzle hydrants planted at convenient points on the line. The pipes on all intersecting streets are connected with this 12-inch main, as also the 6-inch distribution pipe on the same avenue.

A 12-inch main was laid on Thirty-first street, from Cottage Grove avenue to Wabash avenue, connecting with the 24-inch main on the latter avenue, and with the 8-inch distribution pipe on the former avenue.

The balance of the pipes laid are from four to eight inches in diameter.

Unless Union street should be opened from Madison street to Monroe street, the 16-inch main, which lays on private property, formerly owned by the city, and known as the Sycamore School Lot, from the 16-inch main on Union street to the 12 and 16-inch mains on Monroe street, will probably have to

be removed and relaid via Madison street to Desplaines street, and thence to Monroe street. In case Union street should be opened it would only be necessary to move the main a few feet from its present location.

On several streets 4-inch pipe has been taken up and replaced with larger size, notably on Washington street from Halsted street to Ogden avenue, on Warren avenue from Oakley avenue to Rockwell street, on Michigan avenue from Lake Park Place to 250 feet south of Twelfth street, and on Monroe street from Wabash avenue to Michigan avenue. This old pipe was at once relaid in other localities.

On Washington street, from Halsted street westward, several fire hydrants were moved at the request and expense of the West Park Commission.

Several fire hydrants were also moved on Michigan avenue. This was owing to change of curb line, and was done at the expense of the South Park Commission.

At several points on State street the distribution pipe was moved a few feet eastward, from Twelfth street to Harmon court. The removal was made to accommodate the Chicago City Railway Company in the construction of their "cable" road, and at the expense of said company. At other points the change of location was necessitated by reason of change of street line, the pipe being in line of curb walls.

Nearly all of the fire hydrants have been packed with manure, to protect them from frost, the saw dust from the basins being first removed.

The largest portion of the fire hydrants planted this season are $2\frac{1}{2}$ and 4-inch double nozzle. In many instances single hydrants have been replaced with $2\frac{1}{2}$ and 4-inch double nozzle hydrants.

The following tabular statement shows in detail the work of pipe extension, number of stop valves and hydrants set, etc., for the year 1881.

SOUTH DIVISION.

ON WHAT STREET.	BETWEEN WHAT STREETS.	Length in feet.	Diam. in inches.
Archer avenue.....	Beers St. to 32 ft. west of Thirty-third court	775	6
Broad street.....	Archer avenue northward.....	240	4
Calumet avenue.....	Thirty-eighth street northward.....	428	6
Calhoun place.....	Franklin street eastward.....	114	6
Couch place.....	Franklin street to east line of Fifth ave.	394	6
Couch place.....	Fifth avenue eastward.....	70	6
Court place.....	Dearborn street to State street.....	430	8
Douglas avenue.....	Paulina street to Marshfield avenue.....	336	6
Eldridge court.....	Wabash avenue to Michigan avenue.....	365	8
*Emerald avenue.....	Twenty-ninth street to Thirtieth street.....	660	4
*Emerald avenue.....	Thirty-third street to Thirty-fourth street	662	4
Eda street.....	Across State street.....	84	6
Farrell street.....	Archer avenue to Lyman street.....	840	4
Fourth avenue.....	Polk street to Twelfth street.....	1,675	8
Franklin street.....	Madison street to Adams street.....	700	8
Fuller street.....	Church place to Short street.....	300	6
Forest avenue.....	Across Thirty-eighth street.....	24	6
Groveland Park ave.	Twenty-ninth street to Thirtieth street.....	844	6
Harrison street.....	Franklin St. to center of water pipe tunnel	361	36
Keeley street.....	Lyman street northward.....	415	6
Lake Park place.....	Michigan avenue eastward.....	60	6
Lake avenue.....	Pier street to Douglas avenue.....	1,950	6
La Salle street.....	Twenty-fifth street northward.....	500	6
Lowe avenue.....	Thirtieth street to Thirty-first street.....	502	6
Lock street.....	Archer avenue to 48 ft. north of Lyman st	800	8
Market street.....	Van Buren street to Congress street.....	378	8
*Marshfield avenue.	Douglas avenue to Thirty-seventh street.	1,308	4
Michigan avenue.....	Lake Park place to 250 ft. S. of Twelfth st	636	6
Monroe street.....	Wabash avenue to Michigan avenue.....	350	6
Parnell avenue.....	Thirty-first to Thirty-second street.....	650	4
Peck court.....	State street to Michigan avenue.....	692	8
Prospect place.....	Vincennes avenue eastward.....	216	8
Quincy street.....	Fifth avenue to Market street.....	715	8
Rhodes avenue.....	90 ft. S. of S. line of 32d st. to 130 ft. N. of 33d	430	6
Rhodes avenue.....	Thirty-third street to Thirty-fourth street	690	6
State street.....	Thirty-sixth street to Thirty-seventh street	600	8
Short street.....	Hickory street to Fuller street.....	384	6
Spring street.....	Crossing west at State street.....	32	6
Twenty-fourth street	Crossing west at State street.....	32	6
Twenty-seventh st ..	Crossing west at State street.....	39	6
Thirtieth street.....	Crossing east at Wentworth avenue.....	48	6
Thirty-first street..	Cottage Grove avenue to Wabash avenue	3,107	12
Thirty-second street	Crossing west at State street.....	36	6
Thirty-second street	Parnell avenue to Wallace street.....	300	4
Thirty-third street..	Beers street to Archer avenue.....	320	8
Thirty-third street..	Across Michigan avenue.....	120	6
Amount carried forward.....		24,412	

* This pipe was laid at the expense of property owners under rule of department; as soon as it pays the required revenue, the money advanced to cover costs of laying will be refunded.

SOUTH DIVISION.—CONTINUED.

ON WHAT STREET.	BETWEEN WHAT STREETS.	Length in feet.	Diam. in Inches.
	Amount brought forward.....	24,412	
Thirty-third street..	East line of Forest avenue westward.....	68	6
Thirty-fourth street..	Michigan avenue westward.....	224	6
Thirty-fourth street..	Across State street.....	120	6
Thirty-fourth court..	Laurel street westward.....	424	4
Thirty-sixth street..	Across State street.....	84	6
Thirty-sixth street..	Crossing west at State street.....	36	6
Thirty-seventh street..	Across State street.....	84	6
Thirty-seventh street..	Halsted street to Tucker street.....	375	6
Thirty-seventh court..	Across State street.....	84	6
Thirty-eighth street..	Across State street.....	120	6
Thirty-eighth street..	Forest avenue to Calumet avenue.....	349	6
Thirty-eighth street..	Tucker street to Laurel street.....	790	6
Ullman street.....	Thirty-third street to Douglas avenue.....	1,250	8
Vernon avenue.....	200 feet south of 32d street to 33d street.....	480	6
Wallace street.....	Thirty-sixth street to Thirty-seventh street.....	560	6
Whitehouse place..	W crossing at Wentworth avenue.....	36	6
		29,756	
	Branch pipe for hydrants.....	2,460	
	Total in South Division.....	32,216	

WEST DIVISION.

ON WHAT STREET.	BETWEEN WHAT STREETS.	Length in Feet.	Diam. in Inches.
Allport avenue	Nineteenth street southward.....	373	4
Albert street.....	Eighteenth street southward.....	360	6
Arthington street..	Centre avenue to Lytle street.....	400	6
Arthington street..	Crossing at Loomis street.....	44	6
*Archer avenue	Douglas av. to 228 feet east of Western av.	2,380	6
Ashland avenue.....	22d st. to tower at W. pumping station ..	554	36
Ashley street.....	Leavitt street to Hoyne avenue.....	630	6
Ambrose street.....	150 feet east of Hoyne avenue eastward.....	150	4
Alley between Jack- son & Van Buren st	Throop street eastward.....	332	6
Bishop court.....	South crossing at Washington street ..	50	6
Blackhawk street..	Elston avenue to Luce street.....	328	6
Blanche street.....	Noble street eastward.....	250	4
Blue Island avenue..	Eighteenth street to Ashland avenue....	2,331	36
Blue Island avenue..	Fifteenth street to Rebecca street.....	428	36
	Amount carried forward.....	8,619	

* This pipe was laid at the expense of private parties, under rule of department; as soon as it pays the required revenue, the money advanced to cover costs of laying will be refunded.

WEST DIVISION.—CONTINUED.

ON WHAT STREET.	BETWEEN WHAT STREETS.	Length in Feet.	Diam. in Inches.
	Amount brought forward.....	8,619	
Blucher street	Wood street to Lull street.....	350	4
Carpenter street	Crossing Washington street.....	50	6
Carpenter street	George street northward.....	235	4
Campbell avenue	North crossing at Jackson street.....	38	6
Congress street	West crossing at Loomis street.....	27	6
Cicero court.....	Crossing at Jackson street.....	46	6
Curtis street.....	Across Washington street	110	6
Douglas avenue	Lincoln street to Hoyne avenue	1,100	6
Ellsworth street	Sebor street to Polk street	545	6
Elston avenue	Paulina street to Webster avenue.....	1,060	8
Elston avenue	Webster avenue to Snow street.....	3,080	4
Elk Grove avenue	North avenue to Wabansia avenue.....	585	6
† Erie street.....	Leavitt to Hoyne avenue.....	124	4
Erie street.....	Across Milwaukee avenue.....	144	6
Evergreen avenue.....	Park street southwestward.....	530	6
Francisco street	Walnut street to Lake street	475	6
George street	Carpenter street to Sangamon street.....	492	4
Green street	Across Milwaukee avenue.....	148	8
Gilpin place.....	East crossing at Loomis street	44	6
Harrison street	In water pipe tunnel.....	111	36
Henry street.....	Ashland avenue to Paulina street.....	628	6
Hinman street.....	Robey street to Hoyne avenue.....	597	4
Honore street	North crossing at Harrison street.....	30	6
Honore street	Douglas avenue to Thirty-sixth street.....	637	6
Hoyne avenue.....	Ambrose street to Twenty-second street.....	367	4
Hubbard street	99 feet west of Sangamon street to 99 feet east of Sangamon street.....	264	6
Kinzie street.....	Morgan street to Peoria street.....	620	12
Kinzie street.....	Sangamon street to Peoria street	287	4
Kinzie street.....	Sangamon street to Morgan street.....	294	4
Lafin street	Eighteenth street to Nineteenth street.....	668	6
Lafin street.....	Jackson street to Adams street.....	372	6
Lafin street.....	North crossing at Harrison street.....	24	6
Lafin street.....	Jackson street to VanBuren street.....	418	6
Lake street.....	Ada street to Ashland avenue.....	1,550	8
Lake street.....	Rockwell street to Fairfield avenue.....	910	6
Leavitt street.....	Laughton street to Parmalee street.....	360	8
Lincoln street	VanBuren street to Harrison street.....	604	6
Lincoln street	Madison street to Warren avenue	235	6
Lincoln street	Warren avenue to Washington street.....	235	6
Lincoln street	Washington street to Park avenue.....	235	6
Lincoln street	Lake street to Walnut street	236	6
Lincoln street	Walnut street to Fulton street.....	250	8
Lincoln street	Fulton street to Kinzie street	655	8
Lincoln street	Chicago avenue to Erie street.....	910	6
Lincoln street	Ferdinand street to Hubbard street.....	150	6
LeMoynes street.....	Hoyne avenue to Robey street	620	8
	Amount carried forward	30,069	

† In place of pipe frozen.

WEST DIVISION.—CONTINUED.

ON WHAT STREET.	BETWEEN WHAT STREETS.	Length in feet.	Diam. in inches.
	Amount brought forward.....	30,069	
Luce street.....	Blackhawk street northward.....	418	4
Loomis street.....	Rebecca street to Eighteenth street.....	1,034	36
Loomis street.....	Twelfth street to south line Spruce street.....	1,900	8
Loomis street.....	Congress street to Plum street.....	754	8
Macallaster place.....	West crossing at Loomis street.....	43	6
Marshfield avenue.....	Congress street to VanBuren street.....	389	6
Mantine court.....	276 ft s. w. of Milwaukee ave s. westward.....	100	4
May street.....	Crossing at Washington street.....	50	6
Milwaukee avenue.....	Chicago ave to Hubbard & Union streets.....	3,400	12
Newberry avenue.....	Fourteenth street to Wright street.....	441	4
Oakley avenue.....	Warren avenue to Washington street.....	180	6
Oakley avenue.....	Washington street to Park avenue.....	262	6
Oakley avenue.....	Park avenue to Lake street.....	180	6
Oakley avenue.....	Parmalee street to Moore street.....	300	6
Ogden avenue.....	Crossing at Washington street.....	70	6
Ohio street.....	Crossing at Milwaukee avenue.....	81	8
Park avenue.....	Rockwell street eastward.....	307	4
Paulina street.....	Crossing at Walnut street.....	60	8
Parmalee street.....	Oakley avenue eastward.....	200	4
Parmalee street.....	Leavitt street westward.....	470	4
Peoria street.....	Milwaukee avenue southward.....	57	8
Peterson street.....	Hoyne avenue to Robey street.....	665	4
Polk street.....	West crossing at Loomis street.....	29	6
Polk street.....	Ellsworth street westward.....	691	6
Rebecca street.....	Blue Island avenue to Loomis street.....	724	36
Robey street.....	Twelfth street to Thirteenth street.....	567	6
Sangamon street.....	Hubbard st. to Kinzie st. (w.s. under side'lk).....	375	4
Sangamon street.....	Hubbard st. to Kinzie st. (e.s. under side'lk).....	375	4
Sangamon street.....	Fulton st. to Carroll av. (e. s. under side'lk).....	375	4
Sangamon street.....	Fulton st. to Carroll av. (w.s. under side'lk).....	375	4
Sangamon street.....	Hubbard street northward.....	100	6
School street.....	410 feet west of Desplaines st. westward.....	170	4
Seymour street.....	Bryson street northward.....	350	6
Sebor street.....	Ellsworth street westward.....	200	6
Sixteenth street.....	Ashland avenue to Laflin street.....	358	8
Sibley avenue.....	Crossing at Harrison street.....	31	6
Shelden street.....	Crossing at Washington street.....	48	6
Sheldon street.....	Crossing at Lake street.....	140	6
St. John's place.....	Lake street northward.....	50	6
Superior street.....	Across Lincoln street.....	54	6
*Superior street.....	Wood street westward.....	314	6
Taylor street.....	Wood street to Lincoln street.....	585	8
Taylor street.....	Beach street eastward.....	514	8
Throop street.....	Crossing at Washington street.....	45	6
Twelfth street.....	Robey street eastward.....	87	6
Thirteenth street.....	Hoyne avenue to Robey street.....	625	6
	Amount carried forward.....	48,612	

* This pipe was laid at the expense of private parties, under rule of department; as soon as it pays the required revenue, the money advanced to cover costs of laying will be refunded.

WEST DIVISION.—CONTINUED.

ON WHAT STREET.	BETWEEN WHAT STREETS.	Length in Feet.	Diam. in Inches.
	Amount brought forward	48,612	
Thirteenth place....	Hoyne avenue to Robey street.....	634	6
Twentieth street....	Ashland avenue westward	290	6
Union Park place....	Lake street northward	60	6
Union street.....	Twenty-first st. to Twenty-second st.....	440	6
Vanhorn street.....	Paulina street to Wood street.....	675	6
Vanhorn street.....	Ashland avenue to Laflin street.....	674	6
Vanhorn street.....	Western avenue to Leavitt street.....	1,294	6
Vanhorn street.....	West crossing at Laflin street	26	6
VanBuren street.....	Laflin street westward.....	220	6
Vernon Park place....	East crossing on Loomis street.....	43	6
Warren avenue	Oakley avenue to Rockwell street.....	2,000	6
Washington street....	Halsted street to Ogden avenue	4,517	6
Walnut street.....	East crossing on Francisco street.....	25	6
Western avenue.....	Nineteenth street to Vanhorn street	308	8
Western avenue.....	South line of Vanhorn street northward	40	8
Wilcox avenue.....	290 ft E of E line of California av. eastw'rd	60	6
Willard place	North crossing at Washington street.....	40	6
Wood street	Blue Island avenue southward.....	1,014	6
Wood street	Vanhorn street to Nineteenth street.....	336	8
Wood street	South crossing at Taylor street	25	8
Wood street	Park avenue to Lake street.....	264	6
Wood street	Lake street to Walnut street	270	6
Wood street	York street to Taylor street	1,311	8
Wood street	South crossing at Harrison street.....	43	8
		63,212	
	Branch pipes for hydrants.....	2,066	
	Total in West Division.....	65,278	

NORTH DIVISION.

ON WHAT STREET.	BETWEEN WHAT STREETS.	Length in Feet.	Diam. in Inches.
Astor street.....	Goethe to Scott street	206	8
Belden avenue.....	West crossing at North Park avenue	57	6
Dayton street.....	Blackhawk street to North avenue	755	6
Elm street.....	Dearborn avenue to Clark street	300	8
Fullerton avenue.....	North Park avenue westward	69	6
Garfield avenue.....	Dayton street to Fremont street	300	6
*Hammond street.....	Eugenie street northward	265	4
Jay street.....	Webster avenue northward	400	6
*North Park avenue.....	Webster avenue to Fullerton avenue	1,325	6
North Water street.....	LaSalle street to Dearborn avenue	770	6
Orchard street.....	Belden avenue to Fullerton avenue	530	6
Oak street.....	Dearborn avenue to State street	384	8
Oak street.....	Lake Shore Drive westward	75	4
Superior street.....	State street to Cass street	300	4
Webster avenue.....	West crossing at North Park avenue	52	6
		5,788	
	Branch pipes for hydrants.....	331	
	Total in North Division.....	6,119	

* This pipe was laid at the expense of private parties, under rule of department; as soon as it pays the required revenue, the money advanced to cover costs of laying will be refunded.

RECAPITULATION OF PIPE LAID DURING 1881.

DIVISION.	DIAMETER OF PIPES.					Total in Feet.
	4-inch.	6-inch.	8-inch.	12-inch.	36-inch.	
North.....	640	4,258	890	.....	.....	5,788
South.....	5,084	13,003	8,201	3,107	361	29,756
West.....	10,870	33,125	11,015	4,020	5,182	63,212
Totals....	16,594	49,386	20,106	7,127	5,543	98,756
Total amount of branch pipe for hydrants...						4,857

103,613

Total length of pipe laid during the year..... $19\frac{3\frac{2}{3}}{2\frac{2}{3}}\frac{2\frac{2}{3}}{8\frac{2}{3}}$ miles.

Total length in use, as per last report..... $45\frac{5\frac{2}{3}}{2\frac{2}{3}}\frac{3\frac{5}{8}}{8\frac{2}{3}}$ miles.

Total..... $475\frac{2\frac{4}{8}}{2\frac{2}{3}}\frac{8}{8\frac{2}{3}}$ miles.

Less taken up, $2\frac{5\frac{9}{8}}{2\frac{2}{3}}\frac{9}{8}$, or abandoned, $\frac{3\frac{2}{3}}{2\frac{2}{3}}\frac{6\frac{0}{8}}{8\frac{2}{3}}$ $2\frac{3\frac{8}{8}}{2\frac{2}{3}}\frac{5\frac{9}{8}}{8\frac{2}{3}}$ miles.

Grand total length of pipe to Dec. 31st, 1881. $472\frac{1\frac{6}{8}}{2\frac{2}{3}}\frac{6\frac{2}{8}}{8\frac{2}{3}}$ miles.

DISTRIBUTION OF PIPE LAID, BY WARDS, DURING 1881.

WARDS.	DIAMETER OF PIPES.					Total in Feet.
	4-inch.	6-inch.	8-inch.	12-inch.	36-inch.	
First		988	2,283			3,271
Second		636	2,732		361	3,729
Third		32				32
Fourth		6,236	816	3,107		10,249
Fifth	5,084	9,138	2,370			16,592
Sixth	2,157	6,371	1,044		3,574	13,146
Seventh	441	2,454	358		1,497	4,750
Eighth		1,954	514			2,468
Ninth	170	1,932				2,102
Tenth	2,081	364	148	1,833		4,426
Eleventh		4,807	4,204			9,011
Twelfth	307	4,845	1,964			7,116
Thirteenth		3,344	965			4,309
Fourteenth	5,714	1,937	1,818	2,187		11,656
Fifteenth	265	2,733				2,998
Sixteenth		755	206			961
Seventeenth						
Eighteenth	375	770	684			1,829
Total	16,594	49,386	20,106	7,127	5,432	98,645
Laid across the river at Harrison street						111
Branch pipe for hydrants						4,857
Total amount laid during the year						103,613

PIPE TAKEN UP OR ABANDONED.

The pipe taken up or abandoned during the year, and the pipe substituted therefor, is shown in the following tabulated list:

ON WHAT STREET.	LOCATION OF PIPE.	Removed.		Re-laid.	
		Length in feet.	Diam. in inches.	Length in feet.	Diam. in inches.
Bishop court....	Crossing at Washington street..	50	4	50	6
Curtis street.....	Crossing at Washington street..	110	4	110	6
Curtis street.....	North and south of Lake street..	110	4	110	6
Green street.....	Crossing at Milwaukee avenue..	148	4	148	8
Green street.....	Crossing at Washington street..	100	4	100	6
Green street.....	Crossing at Lake street	50	4	50	6
Harrison street...	Desplaines to Halsted street....	800	4		
	East and west of and across San-				
Hubbard street...	gamon street.....	264	4	264	6
*Kinzie street....	Morgan street to Sangamon st..	*300	8	Abandon'd	
*Kinzie street....	Sangamon street to Peoria street	*280	6	Abandon'd	
Kinzie street.....	Lincoln street to Wood street...	*700	6	Abandon'd	
Lake avenue.....	Pier street to Douglas avenue..	1,950	4	1,950	6
May street.....	Crossing at Washington street..	50	4	50	6
	Lake Park place to 250 feet south				
Michigan avenue	of Twelfth street	636	4	663	6
Monroe street....	Wabash ave. to Michigan ave...	350	4	350	6
Ogden avenue....	Crossing Washington street....	70	4	70	6
Ohio street.....	Crossing Milwaukee avenue....	81	4	81	8
Paulina street....	Crossing Walnut street.....	40	4	40	8
Peoria street.....	Crossing Washington street....	40	4	40	6
Peoria street.....	Crossing Lake street.....	100	4	100	6
*Sangamon street	Fulton street to Hubbard street	*1,180	4	Abandon'd	
Sangamon street.	North from Hubbard street....	100	4	100	6
Sangamon street.	Crossing at Washington street..	60	4	60	6
Sheldon street...	Crossing at Washington street..	48	4	48	6
	North and south of and crossing				
Sheldon street...	Lake street.....	140	4	140	6
Throop street....	Crossing at Washington street..	45	4	45	6
Union Park place	Northward from Lake street...	60	4	60	6
Warren avenue...	Oakley avenue to Rockwell st..	2,000	4	2,000	6
Washington street	Halsted street to Ogden avenue.	4,517	4	4,517	6
Willard place....	Crossing at Washington street..	40	4	40	6
	Abandoned	-----	---	3,260	
		1,447		14,419	

* Abandoned.

The following comprises the list of all the pipe in use at the close of the year 1881.

	LINEAL FEET.
36 inch cast iron pipe.....	40,923
30 inch cast iron pipe.....	18
28 inch cast iron pipe.....	160
24 inch cast iron pipe.....	67,979
24 inch wrought iron syphon pipe at Twelfth street.	258
16 inch cast iron pipe.....	58,166
12 inch cast iron pipe.....	135,122
10 inch cast iron pipe.....	8,012
8 inch cast iron pipe.....	494,473
6 inch cast iron pipe.....	970,538
4 inch cast iron pipe.....	701,233
3 inch cast iron pipe.....	16,947

Total in feet.....2,493,829

Or $472\frac{1}{3}\frac{8}{10}$ miles.

The following is a record of the number, size and location of stop valves put in during 1881:

WEST DIVISION.

LINE OF PIPE.	LOCATION.	SIZE OF VALVES.						
		4"	6"	8"	12"	16"	24"	36"
Ada street	S. line of Lake street			1				
Ada street	N. " " Washington street			1				
Ann street	N. " " Lake street		1					
Ann street	N. " " Washington street		1					
Arthington street	W. " " Centre avenue		1					
Ashley street	W. " " Hoyne avenue		1					
Blackhawk st.	W. " " Elston avenue		1					
Blanche street	E. " " Noble street	1						
Blucher street	E. " " Lull place	1						
Bishop court	S. " " Washington street		1					
Carpenter street	N. " " Lake street		1					
Carpenter street	N. " " Washington street		1					
Carpenter street	Intersection of Milwaukee av.			1				
Congress street	W. line of Loomis street		1					
Curtis street	N. " " Lake street		1					
Elizabeth street	N. " " Lake street		1					
Elston avenue	N. " " Webster ave.			1				
Elston avenue	S. " " Fullerton avenue	1						
Erie street	E. " " Milwaukee avenue			1				
Erie street	W. " " Milwaukee avenue			1				
Evergreen ave.	S. " " Fowler street		1					
Francisco street	N. " " Lake street		1					
Francisco street	S. " " Fulton street			1				
Green street	N. " " Lake street		1					
Green street	N. " " Washington street		1					
Green street	N. " " Milwaukee avenue			1				
Green street	S. " " Milwaukee avenue			1				
Harrison street	W. end of River Pipe Tunnel						1	
Harrison street	W. line of Loomis street				1			
Halsted street	Intersection of Milwaukee av.		1					
Hoyne avenue	S. line of Archer avenue		1					
Hoyne avenue	N. " " Madison street			1				
Hoyne avenue	S. " " Twenty-second st.	1						
Hubbard street	E. " " Sangamon street	1						
Hubbard street	W. " " Sangamon street	1						
Huron street	W. " " Milwaukee avenue		1					
Lake street	W. " " Ada street	1						
Lake street	W. " " Ada street			1				
Lake street	W. " " Sheldon street			1				
Lake street	E. " " Bryan place			1				
Lake street	E. " " Ashland avenue			1				
Lake street	74 east of Ashland avenue			1				
Lincoln street	650 ft. S. Blue Island av., fire c.		1					
Lincoln street	S. line of Kinzie street			1				
Lincoln street	S. " " Van Buren street		1					
Lincoln street	N. " " Huron street		1					
Loomis street	S. " " Polk street			1				
Loomis street	S. " " Taylor street			1				
Luce street	N. " " Blackhawk street	1						
May street	N. " " Lake street		1					
May street	N. " " Washington street		1					
Madison street	W. " " Leavitt street			1				
Amount carried forward		8	23	19	1			1

WEST DIVISION—CONTINUED.

LINE OF PIPE.	LOCATION.	SIZE OF VALVES.						
		4"	6"	8"	12"	16"	24"	36"
	Amount brought forward.....	8	23	19	1			1
Meagher street...	W. line of Stewart avenue.....	1						
Morgan street...	N. " " Kinzie street.....	1						
Morgan street...	N. " " Lake street.....			1				
Morgan street...	N. " " Washington street.....			1				
Milwaukee ave...	S. " " Erie street.....				1			
Milwaukee ave...	N. " " Hubbard street.....				1			
Newberry street...	S. " " Fourteenth street.....	1						
Oakley avenue...	S. " " Nineteenth street.....	1						
Ogden avenue...	N. " " Washington street.....		1					
Ohio street.....	E. " " Milwaukee avenue.....			1				
Parmalee street...	W. " " Leavitt street.....	1						
Paulina street...	1200' S. Blue Island av., fire c.		1					
Paulina street...	N. line of Lake street.....			1				
Peoria street...	N. " " Washington street.....		1					
Peoria street...	S. " " Milwaukee avenue.....			1				
Peoria street...	N. " " Kinzie street.....	1						
Peoria street...	N. " " Lake street.....		1					
Polk street.....	N. " " Loomis street.....			1				
*Polk street.....	E. " " Canal street.....		1					
Robey street...	S. " " Twelfth street.....		1					
Sacramento ave...	S. " " Fulton street.....			1				
Sangamon street...	N. " " Lake street.....		1					
Sangamon street...	N. " " Washington street.....		1					
Sangamon street...	Intersection of Milwaukee ave.		1					
Sangamon street...	E. line of Fulton street.....	1						
Sangamon street...	W. " " Fulton street.....	1						
Sangamon street...	E. " " Carroll avenue.....	1						
Sangamon street...	W. " " Carroll avenue.....	1						
Sheldon street...	N. " " Lake street.....		1					
Sheldon street...	N. " " Washington street.....		1					
St. John's place...	N. " " Lake street.....		1					
Taylor street....	W. " " Wood street.....			1				
Thirteenth street...	W. " " Robey street.....		1					
Thirteenth place...	W. " " Robey street.....		1					
Thirty-third st...	E. " " Wood street.....			1				
Union Park pl'ce	N. " " Lake street.....		1					
*Warren avenue...	W. " " Western avenue.....		1					
Washington st...	E. " " Ogden avenue.....		1					
*Washington st...	W. " " Morgan street.....			1				
*Washington st...	W. " " Peoria street.....		1					
*Washington st...	W. " " May street.....		1					
*Washington st...	W. " " Sheldon street.....		1					
Total for West Division.....		18	43	29	3			1
Previously put in.....		345	642	470	59	35	15	3
Totals.....		463	685	499	62	35	15	4
Less by 4-in. valves replaced by 6 and 8-in. valves		6						
Grand total for West Division.....		457	685	499	62	35	15	4

*In place of 4-inch valve.

ENGINEER'S REPORT.

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WEST DIVISION—CONTINUED.

CORNER	WHERE LOCATED.	Size of Hydrants		
		4 inch Double.	3½ inch Double.	3½ inch Single.
	Amount brought forward.....	16	22	9
West +	Side Jefferson st., bet. Jackson st. and Van Buren st.			1
N. W.	Johnson street and Eighteenth place.....		1	
West	Side Johnson st., between Sixteenth and Eighteenth sts		1	
West	Side Johnson st., between Taylor and Twelfth sts.			1
N. W. +	Kinzie street and W. Water street.....			1
N. W.	Kinzie street and Paulina street.....		1	
N. W.	Kinzie street and Halsted street.....	1		
N. E.*	Lake street and Sangamon street.....	1		
S. W.*	Lake street and Green street.....	1		
N. E.*	Lake street and St. John's place.....	1		
N. W.	Leavitt street and Parmalee street.....		1	
N. W.	Loomis street and Harrison street.....	1		
S. W.	Loomis street and Polk street.....		1	
West	Side Loomis street, between Polk st. and Taylor st..		1	
N. E.	Lumber street and Jefferson street.....	1		
N. W.	Lincoln street and Carroll avenue.....		1	
S. W.	Lincoln street and Ogden avenue.....		1	
West	Side Lincoln street, 300 feet south of Blue Island av.	1		
West	Side Luce street, 380 feet north of Blackhawk street.			1
N. W.*	Madison street and Hoyne avenue.....	1		
N. W.	Madison street and Lincoln street.....	1		
N. W.	Congress street and Centre avenue.....		1	
N. E.	Congress street and Western avenue.....		1	
N. W.	Curtis street and Washington street.....		1	
N. W. +	Desplaines street and Forquar street.....			1
S. W.	Elston avenue and Webster avenue.....		1	
S. W.	Elston avenue and Fullerton avenue.....			1
S. W.	Elston avenue and Snow street.....			1
West	Side Elston av., between Snow st. and Fullerton av..			1
S. W.	Elk Grove avenue and Wabansia avenue.....			1
N. W.	Francisco street and Lake street.....			1
S. W.	Francisco street and Walnut street.....			1
N. W.	George street and Sangamon street.....			1
N. E.*	Green street and Washington street.....		1	
N. W.	Harrison street and Western avenue.....		1	
N. W.	Harrison street and Jefferson street.....	1		
N. E.	Harrison street and Law avenue.....			1
N. W.	Hastings street and Laflin street.....			1
N. W.	Hoyne avenue and Twenty-second street.....			1
N. E.	Hinman street and Hoyne avenue.....			1
N. E.*	Hubbard street and Elizabeth street.....	1		
N. W.	Paulina street and Ogden place.....			1
N. W.	Paulina street and Walnut street.....	1		
N. W.	Paulina street and Henry street.....			1
N. W.	Paulina street and Harrison street.....		1	
S. W.*	Peoria street and Lake street.....	1		
N. E.	Polk street and Ashland avenue.....		1	
	Amount carried forward.....	29	38	27

+ Renewed.

* In place of single hydrants.

J. L. L.

SOUTH DIVISION.

LINE OF PIPE.	LOCATION.	SIZE OF VALVES.						
		4"	6"	8"	12"	16"	24"	36"
Court place.....	E. line of Dearborn street.....			1				
Court place.....	W. " " State street.....			1				
Couch place.....	W. " " Fifth avenue.....		1					
Couch place.....	E. " " Fifth avenue.....		1					
Clark street.....	122 ft. N. Wash'ton, fire cist'n		1					
Eda street.....	E. line of State street.....		1					
Emerald ave.....	S. " " Thirty-third st.....	1						
Franklin street.	Bet. Monr'e & Ad'ms, fire cist'n		1					
Franklin street.	Bet. Monr'e & M'dson, fire cist'n		1					
Fourth avenue..	N. line of Twelfth street.....			1				
Fourth avenue..	S. " " Twelfth street.....			1				
Grovel'd P'k ave	S. " " Twenty-ninth st.....		1					
Harrison street..	E. end of river pipe tunnel.....							1
*Lake avenue....	S. line of Douglas avenue.....		1					
Market street....	S. " " Van Buren street.....			1				
*Michigan ave....	S. " " Twelfth street.....		1					
Parnell avenue..	S. " " Thirty-first st.....	1						
Rhodes avenue..	S. " " Thirty-third st.....		1					
Thirtieth st.....	E. " " Wentworth ave.....		1					
Thirty-first st....	E. " " South Park ave.....				1			
Thirty-first st....	E. " " Prairie avenue.....				1			
Thirty-first st....	E. " " Wabash avenue.....				1			
Thirty first st....	E. " " Michigan avenue.....				1			
Thirty-third st....	E. " " Michigan avenue.....		1					
Thirty-fourth st..	E. " " State street.....		1					
Thirty-sixth st....	E. " " State street.....		1					
Thirty-seventh st.	E. " " State street.....		1					
Th'ty-seventh crt	E. " " State street.....		1					
Thirty-eighth st.	E. " " State street.....		1					
Vernon avenue..	S. " " Thirty-first street.....		1					
Wallace street ..	N. " " Thirty-seventh st.....		1					
Total for South Division.....		2	19	5	4			1
Previously put in.....		132	346	303	50	10	11	3
Totals.....		134	365	508	54	10	11	4
Less by 4" Valves replaced by 6" Valves.....		2						
Grand Totals for South Division.....		132	365	508	54	10	11	4

*In place of 4" valve.

NORTH DIVISION.

LINE OF PIPE.	LOCATION.	SIZE OF VALVES.						
		4"	6"	8"	12"	16"	24"	36"
Clybourne ave..	N. line of Webster avenue...	1						
Elm street.....	E. " " Clark street			1				
Jay Street	N. " " Webster avenue...		1					
North Park ave..	S. " " Fullerton avenue...		1					
North Park ave..	N. " " Webster avenue...		1					
North Water st..	E. " " La Salle street.....		1					
North Water st..	E. " " Clark street		1					
Webster avenue..	E. " " Clybourne avenue...			1				
Alley.....	W. " " Dearborn ave., bet Kinzie st. and Michigan st..		1					
Total for North Division...		1	6	2				
Previously put in.....		173	256	209	25	9	8	1
Grand Total for North Div..		174	262	211	25	9	8	1

RECAPITULATION.

DIVISIONS.	SIZE OF VALVES.							
	4 inch.	6 inch.	8 inch.	12 inch.	16 inch.	24 inch.	36 inch.	Totals.
North.....	174	262	211	25	9	8	1	690
South	133	365	508	54	10	11	4	1,085
West.....	456	685	499	62	35	15	4	1,756
Grand total in city.	763	1,312	1,218	141	54	34	9	3,531

FIRE HYDRANTS.

Owing to the mild winter the hydrants have required but little attention to protect them from frost. Nearly all the hydrants throughout the city are inclosed in substantial brick chambers, from which all waste water is drained by connection with sewers. All stop valves are also inclosed in brick chambers.

The following list gives the number, size and location of hydrants added during the year.

WEST DIVISION.

CORNER	WHERE LOCATED.	Size of Hydrants			
		4 inch Double.	2½ inch Double	2½ inch Single.	
S. W.*	Ada street and Washington street.....	1			
S. E.	Ada street and Lake street.....	1			
North	Side Ambrose street, 300 feet east of Hoyne avenue..				1
N. W.	Ashland avenue and Harrison street.....		1		
West	Side Albert street, 300 feet south of Eighteenth street	1			
S. W.	Ashland avenue and Harrison street.....		1		
West	Side Ashland avenue, 397 feet south of Polk street....		1		
West	Side Ashland avenue, 92 feet south of Kansas street..		1		
N. E.	Blackhawk street and Luce street.....		1		
N. E.*	Blue Island avenue and Wood street.....		1		
N. E.	Blue Island avenue and Roby street.....		1		
N. W.	Blue Island avenue and Hoyne avenue.....		1		
East	Side Bryan place, between Randolph and Lake streets	1			
N. W.	Canal street and Fifteenth street.....		1		
West*	Side Canal street, between Bunker and Dekoven sts..		1		
West	Side Canal street, 300 feet south of Eighteenth street		1		
West	Side Carpenter street, 235 feet north of George street				1
S. E.†	Center avenue and Twentieth street.....				1
N. W.†	Clinton street and Sebor street.....				1
N. W.†	Clinton street and Mather street.....				1
N. E.†	Clinton street and Ewing street.....				1
N. W.	Congress street and Honore street.....				1
N. W.*	Madison street and Leavitt street.....	1			
N. W.	Madison street and Robey street.....	1			
N. W.	Madison street and Paulina street.....	1			
N. W.	Madison street and Wood street.....	1			
N. W.*	May street and Washington street.....		1		
N. W.	Marshfield avenue and Twelfth street.....		1		
S. W.	Marshfield avenue and Taylor street.....		1		
N. W.	Marshfield avenue and York street.....		1		
S. E.	Milwaukee avenue and Morgan street.....	1			
S. W.	Milwaukee avenue and Huron street.....	1			
S. E.	Milwaukee avenue and Erie street.....	1			
S. W.	Milwaukee avenue and Ohio street.....	1			
S. E.	Milwaukee avenue and Green street.....	1			
West	Side Milwaukee av., bet. Chicago av. & Carpenter st.	1			
West	Side Milwaukee ave., bet. Huron st. and Erie st.....	1			
S. W.	Morgan street and Sixteenth street.....		1		
S. E.	Morgan street and Lake street.....	1			
S. W.	Morgan street and Lake street.....		1		
N. W.	Morgan street and Washington street.....		1		
West	Side Morgan street, 300 feet south of Sixteenth street		1		
N. W.	Monroe street and California avenue.....		1		
N. W.	Oakley avenue and Hinman street.....		1		
S. W.	Oakley avenue and Moore street.....		1		
North	Side Jackson st., bet. Oakley av. and Western av....				1
North	Side Jackson st., bet. Campbell av. and Western av....				1
	Amount carried forward.....	16	22		9

* In place of single hydrants.

† Renewed.

WEST DIVISION—CONTINUED.

CORNER	WHERE LOCATED.	Size of Hydrants			
		4 inch Double.	2½ inch Double.	2½ inch Single.	
	Amount brought forward.....	16	22	9	
West +	Side Jefferson st., bet. Jackson st. and Van Buren st.			1	
N. W.	Johnson street and Eighteenth place.....		1		
West	Side Johnson st., between Sixteenth and Eighteenth sts		1		
West	Side Johnson st., between Taylor and Twelfth sts.			1	
N.W. +	Kinzie street and W. Water street.....			1	
N. W.	Kinzie street and Paulina street.....		1		
N. W.	Kinzie street and Halsted street.....	1			
N. E.*	Lake street and Sangamon street.....	1			
S. W.*	Lake street and Green street.....	1			
N. E.*	Lake street and St. John's place.....	1			
N. W.	Leavitt street and Parmalee street.....		1		
N. W.	Loomis street and Harrison street.....	1			
S. W.	Loomis street and Polk street.....		1		
West	Side Loomis street, between Polk st. and Taylor st.		1		
N. E.	Lumber street and Jefferson street.....	1			
N. W.	Lincoln street and Carroll avenue.....		1		
S. W.	Lincoln street and Ogden avenue.....		1		
West	Side Lincoln street, 300 feet south of Blue Island av.	1			
West	Side Luce street, 380 feet north of Blackhawk street.			1	
N.W.*	Madison street and Hoyne avenue.....	1			
N. W.	Madison street and Lincoln street.....	1			
N. W.	Congress street and Centre avenue.....		1		
N. E.	Congress street and Western avenue.....		1		
N. W.	Curtis street and Washington street.....		1		
N.W. +	Desplaines street and Forquar street.....			1	
S. W.	Elston avenue and Webster avenue.....		1		
S. W.	Elston avenue and Fullerton avenue.....			1	
S. W.	Elston avenue and Snow street.....			1	
West	Side Elston av., between Snow st. and Fullerton av.			1	
S. W.	Elk Grove avenue and Wabansia avenue.....			1	
N. W.	Francisco street and Lake street.....			1	
S. W.	Francisco street and Walnut street.....			1	
N. W.	George street and Sangamon street.....			1	
N. E.*	Green street and Washington street.....		1		
N. W.	Harrison street and Western avenue.....		1		
N. W.	Harrison street and Jefferson street.....	1			
N. E.	Harrison street and Law avenue.....			1	
N. W.	Hastings street and Laflin street.....			1	
N. W.	Hoyne avenue and Twenty-second street.....			1	
N. E.	Hinman street and Hoyne avenue.....			1	
N. E.*	Hubbard street and Elizabeth street.....	1			
N. W.	Paulina street and Ogden place.....			1	
N. W.	Paulina street and Walnut street.....	1			
N. W.	Paulina street and Henry street.....			1	
N. W.	Paulina street and Harrison street.....		1		
S. W.*	Peoria street and Lake street.....	1			
N. E.	Polk street and Ashland avenue.....		1		
	Amount carried forward.....	29	38	27	

+ Renewed.

* In place of single hydrants.

41. 1.

WEST DIVISION—CONTINUED.

CORNER	WHERE LOCATED.	Size of Hydrants		
		4 inch Double.	2½ inch Double.	2½ inch Single.
	Amount brought forward.....	29	38	27
N. W.	Polk street and Ellsworth street.....		1	
S. W.	Robey street and Avon place.....	1		
N. W.	Robey street and Walnut street.....	1		
N. W.	Robey street and Thirteenth place.....			1
N. W.	Robey street and Thirteenth street.....			1
N.W.*	Sangamon street and Washington street.....		1	
N.W.*	Sangamon street and Kinzie street.....		1	
West	Side Seward street, between 16th and 18th streets.....		1	
N. E.	Taylor street and Lincoln street.....		1	
N. E.	Twelfth street and Blue Island avenue.....		1	
N. E.	Thirteenth street and Hoyne avenue.....			1
N. E.	Thirteenth place and Lincoln street.....		1	
N. W.	Twenty-second street and Allport avenue.....		1	
N. E.	Vanhorn street and Wood street.....		1	
N. W.	Vanhorn street and Oakley avenue.....		1	
N. W.	Vanhorn street and Leavitt street.....		1	
N. W.	Vanhorn street and Laflin street.....	1		
N. W.	Van Buren street and Laflin street.....		1	
N. E.	Vernon Park avenue and Loomis street.....		1	
West	Side Warren av., between Stanton st. and Western av.....		1	
N. E.*	Warren avenue and Rockwell street.....	1		
West	Side Warren av., between Stanton st. and Rockwell st.....	1		
N. E.*	Washington street and Ogden avenue.....		1	
N. W.	Western avenue and Warren avenue.....		1	
N. W.	Western avenue and Flournoy street.....		1	
N. W.	Willard place and Washington street.....		1	
S. W.	Wood, opposite York street.....		1	
West	Side Wood st., 300 feet south of Blue Island avenue.....	1		
West	Side Wood st., 600 feet south of Blue Island avenue.....		1	
S. W.	York street and Ashland avenue.....		1	
South	Side alley, 250 feet east of Throop street between Jackson street and Van Buren street.....			1
	Total for West Division.....	35	59	31
	Previously put in.....	171	419	1077
	Totals.....	206	478	1108
	Less by single hydrants taken out and replaced by 2½ and 4 inch double nozzles.....			17
		206	478	1091
	Less by single hydrants renewed.....			7
	Grand total for West Division.....	206	478	1084

* In place of single hydrants.

SOUTH DIVISION.

CORNER	WHERE LOCATED.	Size of Hydrants		
		4 inch Double.	2½ inch Double.	2¼ inch Single.
South	Side Adams st. between State st. and Wabash ave...	1		
South	Side Adams st. bet. Michigan ave. and Wabash ave.	1		
East	Side Archer ave., 1095 ft. E. of Western avenue...			1
East	Side Archer ave., 610 ft. W. of Hoyne avenue...			1
East	Side Archer ave., 954 ft. W. of Hoyne avenue...			1
S. E.	Archer avenue and Thirty-third street...			1
S. E.	Archer avenue and Thirty third court...			1
West	Side Arnold st., 300 ft. N. of Twenty-fifth st...			1
N'th *	Side Bonaparte street bet. Lock st. and Fake st...			1
N. W.	Butler street and Kossuth street...		1	
West	Side Broad street, 252 ft. N. W. of Archer ave...			1
West	Side Calumet ave., 300 ft. N. of Thirty-eighth st...			1
N.W.*	Calumet avenue and Douglas avenue...			1
N. W.	Calumet avenue and Thirty-eighth street...			1
N. W.	Couch place and Fifth avenue...	1		
N. W.	Court place and State street...	1		
N.W.*	Cottage Grove avenue and Twenty-seventh street...			1
N. E.	Douglas avenue and Lincoln street...		1	
East †	Side Douglas ave., 350 ft. W. of Cottage Grove ave...		1	
N. W.	Emerald avenue and Thirtieth street...			1
West	Side Emerald ave., bet. 33d street and 34th street...			1
N.W.†	Eldridge court and Michigan avenue...	1		
West	Side Ellis avenue, 475 ft. S. of Thirty-seventh st...			1
East	Side Farrel st., between Archer ave. and Lyman st...			1
East	Side Fourth ave., 250 ft. S. of Polk st...		1	
East	Side Fourth ave., 250 ft. N. of Taylor st...		1	
S. E.	Fourth avenue and Twelfth street...		1	
East	Side Fourth ave., 250 ft. N. of Twelfth st...	1		
West	Side Fourth ave., 250 ft. S. of Taylor st...		1	
West	Side Fourth ave., 265 ft. S. of Van Buren st...	1		
N. W.	Fuller street and Short street...			1
West	Side Groveland Park ave., bet 29th st. and 30th st...		1	
East	Side Grove st., 300 ft. N. of Twenty-second st...			1
S. W.	Honore street and Douglas avenue...			1
N. W.	Honore street and Thirty-sixth street...			1
S. E.	Indiana avenue and Fourteenth street...		1	
N.W.†	Jackson street and Wabash avenue...	1		
N.W.†	Lake avenue and Douglas avenue...		1	
West *	Side Main street, opposite Twenty-ninth street...			1
S. W.	Marshfield avenue and Thirty-sixth street...			1
N. W.	Marshfield avenue and Thirty-seventh street...			1
S. W.	Marshfield avenue and Douglas avenue...			1
S. E.	Market street and Congress street...	1		
West	Side Michigan ave., bet. 12th street and 13th street...		1	
West	Side Michigan ave., bet. 13th street and 14th street...		1	
West	Side Michigan ave., bet. 16th street and 18th street...		1	
West	Side Michigan ave., bet. 22d street and 23d street...		1	
West	Side Michigan ave., bet. 23d street and 24th street...		1	
Amount carried forward.....		9	15	24

*Renewed.

†In place of single hydrant.

SOUTH DIVISION—CONTINUED.

CORNER	WHERE LOCATED.	Size of Hydrants		
		4 inch Double.	2½ inch Double.	2½ inch Single.
	Amount brought forward.....	9	15	24
West	Side Michigan ave., bet. 24th street and 25th street.....		1	
West	Side Michigan ave., bet. 26th street and 28th street.....		1	
West	Side Michigan ave., bet. 29th street and 30th street.....		1	
S. W.†	Michigan avenue and Twelfth street.....		1	
S. W.†	Michigan avenue and Thirteenth street.....		1	
N.W.†	Michigan avenue and Fourteenth street.....		1	
N.W.†	Michigan avenue and Sixteenth street.....		1	
N.W.†	Michigan avenue and Twenty-first street.....		1	
S. W.†	Michigan avenue and Twenty-fifth street.....		1	
West†	Side Michigan ave., 450 ft. N. of Sixteenth st.....		1	
North	Side Monroe st., bet. Wabash ave. & Michigan ave.....	1		
N. E.	Peck court and State street.....	1		
S. W.	Parnell avenue and Thirty-first street.....			1
N. W.	Parnell avenue and Thirty-second street.....			1
N. E.	Quincy street and Franklin street.....	1		
S. W.	State street and Thirty-sixth street.....		1	
West	Side State st., 300 ft. N. of Thirty-sixth street.....		1	
West	Side State st., 300 ft. N. of Thirty-seventh street.....		1	
West	Side State st., bet. Twelfth and Thirteenth st.....		1	
N. E.	State street and Sixteenth street.....	1		
West	Side State st., bet. Thirteenth st. and Fourteenth st.....		1	
West	Side State st., bet. Fourteenth st. and Fifteenth st.....		1	
S. W.	State street and Archer avenue.....		1	
West	Side State st., bet. Twenty-ninth st. and Thirtieth st.....		1	
West	Side State st., bet. Thirty-fourth st. and Douglas ave.....		1	
S. W.	State street and Thirty-eighth street.....		1	
West*	Side State st., opposite Harmon court.....			1
S.W.†	State street and Sixteenth street.....		1	
S.W.†	State street and Seventeenth street.....		1	
S. E.†	State street and Eighteenth street.....	1		
S. E.†	State street and Van Buren street.....	1		
S.W.†	State street and Nineteenth street.....	1		
N.W.†	State street and Twentieth street.....		1	
S. W.*	State street and Twenty-second street.....			1
N.W.†	State street and Twenty-ninth street.....	1		
S. W.†	State Street and Thirty-ninth street.....		1	
S. E.	Seventeenth street and Grove street.....		1	
N. E.	South Park avenue and Douglas avenue.....		1	
East	Side South Park ave., bet 29th street and 30th street.....		1	
N. W.	Taylor street and Sherman street.....		1	
N. E.	Twentieth street and Dearborn street.....	1		
N. W.	Twenty-first street and State street.....		1	
N. E.	Twenty-ninth street and Groveland Park avenue.....		1	
N. E.	Thirty-third street and State street.....		1	
S. E.	Thirty-fourth street and State street.....		1	
N. W.	Thirty-seventh street and Tucker street.....			1
	Amount carried forward.....	18	47	29

*Renewed.

†In place of single hydrant.

SOUTH DIVISION—CONTINUED.

CORNER	WHERE LOCATED.	Size of Hydrants		
		4 inch Double.	3½ inch Double.	2½ inch Single.
	Amount brought forward.....	18	47	29
N. W.	Thirty-seventh street and Halsted street.....			1
S. E.	Thirty-seventh street and South Park boulevard		1	
N. E.	Thirty-seventh court and State street.....		1	
N. E.	Thirty-eighth street and Laurel street.....			1
N. E.	Thirty-eighth street and Gage street.....			1
N. E.	Ullman street and Douglas avenue.....		1	
West	Side Ullman st., 500 ft. N. of Douglas ave.....		1	
West	Side Ullman st., 860 ft. N. of Douglas ave.....			1
S. W.	Ullman street and Thirty-third street.....		1	
S. W.	Wallace street and Douglas avenue		1	
S. W.*	Wallace street and Twenty-sixth street			1
N.W.*	Wentworth avenue and Thirtieth street.....			1
S. W.*	Wentworth avenue and Thirty-first street.....			1
West*	Side Wentworth ave., bet. 31st st. and 33d st.....			1
N.W.*	Wentworth avenue and Archer avenue.....			1
N.W.*	Wentworth avenue and Thirty-third street.....			1
	Total for South Division.....	18	53	39
	Previously put in.....	156	271	564
	Totals.....	174	324	603
	Less by single hydrants taken out and replaced with 2½ and 4 inch double nozzles.....			19
		174	324	584
	Less by single hydrants renewed.....			12
	Grand Total for South Division.....	174	324	572

*Renewed.

†In place of single hydrant.

NORTH DIVISION.

CORNER	WHERE LOCATED.	Size of Hydrants			
		4-inch Double.	2½ inch Double.	2½ inch Single.	
N. W.	Cass street and Superior street.....			1	
N. E.	Chicago avenue and Cass street.....	1			
N. E.*	Chicago avenue and Clark street.....	1			
N. E.*	Chicago avenue and State street.....	1			
N. E.*	Chicago avenue and Rush street.....	1			
N. W.*	Chicago avenue and Pine street.....	1			
West*	Side Clybourne ave., 300 feet south of Southport ave		1		
West	Side Clybourne ave., 300 ft. south of Wabansia ave.	1			
East. †	Side Clark street, between Elm street and Maple st.			1	
South	Side Fullerton ave., 200 ft. W. C. & N. W. R'y tracks.		1		
West.	Side Hammond st., 265 feet north of Eugenie street.			1	
N. E.*	Huron street and Rush street.....		1		
West	Side Jay street, 260 feet north of Webster avenue...		1		
N. W.	Kinzie street and LaSalle street.....	1			
N. E.†	LaSalle street and Elm street.....			1	
N. E.†	LaSalle street and Chestnut street.....			1	
S. W.*	LaSalle street and North avenue.....	1			
S. W.	North Park avenue and Belden avenue.....			1	
N. W.	North Park avenue and Webster avenue.....			1	
S. W.	North Park avenue and Fullerton avenue.....			1	
West	Side N. Park ave., bet. Belden ave. and Fullerton ave.			1	
S. W.	Orchard street and Fullerton avenue.....			1	
N. E.	Pine street and Michigan street.....			1	
N. W.	Starr street and Franklin street.....			1	
S. W.*	Southport avenue and Clybourne avenue.....		1		
Total for North Division.....		8	5	12	
Previously put in.....		96	172	434	
Totals.....		104	177	446	
Less by single hydrants taken out and replaced by 2½ and 4-inch double nozzles.....				8	
		104	177	438	
Less by single hydrants renewed.....				5	
Grand totals for North Division..		104	177	433	

*In place of single hydrant.

†Renewed.

The following is a list of the number of Hydrants added during the year in each ward:

WARDS.	SIZE OF HYDRANT.			Total.
	4-inch Double.	3½ inch Double.	2½ inch Single.	
First.....	10	....	....	10
Second.....	4	17	1	22
Third.....	3	10	1	14
Fourth.....	1	19	5	25
Fifth.....	....	7	32	39
Sixth.....	5	17	4	26
Seventh.....	....	2	5	7
Eighth.....	1	4	6	11
Ninth.....	....	3	1	4
Tenth.....	6	2	1	9
Eleventh.....	7	10	1	18
Twelfth.....	9	17	4	30
Thirteenth.....	2	2	2	6
Fourteenth.....	5	2	7	14
Fifteenth.....	1	4	7	12
Sixteenth.....	1	....	....	1
Seventeenth.....	....	....	....	....
Eighteenth.....	6	1	5	12
Total.....	61	117	82	260

RECAPITULATION.

TOTAL NUMBER OF HYDRANTS IN THE CITY.

DIVISION.	Size of Hydrants.			Total.
	4-inch Double.	3½ inch Double.	2½ inch Single.	
North.....	104	177	433	714
South.....	174	324	572	1,070
West.....	206	478	1,084	1,769
Grand total in the City....	484	979	2,089	3,553

In addition to the above number of fire hydrants, there are fire cisterns connected with the street mains as follows:

SOUTH DIVISION.

Intersection of Randolph street and Wabash avenue.

- " " Randolph street and State street.
- " " Washington street and State street.
- " " Michigan avenue and Madison street.
- " " State street and Madison street.
- " " Twelfth street and Michigan avenue.
- " " Twelfth street and Wabash avenue.
- " " Thirty-fourth street and Cottage Grove ave.

On Franklin street, between Madison street and Monroe street.

- " Franklin street, between Monroe street and Adams street.
- " Clark street, bet. Washington street and Randolph street.

NORTH DIVISION.

Intersection of Oak and Sedgwick streets.

- " " North avenue and Larrabee street.

WEST DIVISION.

Intersection of Milwaukee avenue and Erie street.

- " " Halsted and Twelfth streets.
- " " Canalport avenue and Eighteenth street.

On Lincoln street, 650 feet south of Blue Island avenue.

- " Wood street, 900 feet south of Blue Island avenue.
- " Paulina street, 1,600 feet south of Blue Island avenue.

WATER METERS.

Most of the meters in use in the city are the "Worthington," a number of the "Union" rotary meters of large size, viz., four and six inch, have been put in during the year in connection with watering stations for locomotive engines and other special purposes.

The following is a list of meters reported in use up to close of year, also the number added and removed during the year.

Size of meters.....	$\frac{3}{8}$	$\frac{1}{2}$	1	1 $\frac{1}{2}$	2	3	4	6	Total.
Number reported in use Dec. 31st, 1880.....	645	92	822	205	121	224	4	.....	2,113
Set during year 1881.....	24	19	41	34	43	13	3	1	178
Whole number.....	669	111	863	239	164	237	7	1	2,291
Number removed during year 1881.....	45	8	58	9	2	5	1	.....	128
Total number in use Dec. 31st, 1881.....	624	103	805	230	162	232	6	1	2,163
Meters in use owned by city.....	414	54	660	163	99	171	2	.....	1,563
Meters in use owned by private parties.....	210	49	145	67	63	61	4	1	600
Total.....	624	103	805	230	162	232	6	1	2,163
Number of meters purchased from manufacturer.....	5	12	.....	20	31	7	1	1	77
Number of meters purchased from private parties.....	19	3	.....	4	3	5	.....	.....	34
Total.....	24	15	.....	24	34	12	1	1	111
On hand Dec. 31st, 1881.....	69	4	45	6	1	5	.....	.....	130

HYDRAULIC ENGINES

for elevator power and other purposes, as a rule have no independent meter attached, the action of the engines themselves, in connection with a suitable automatic register, affords a sufficiently reliable record of the quantity of water used.

The following list shows the number in use and the number added during the past year.

Number in use Dec. 31st, 1880.....	230
Number added during 1881	66

Total number in use Dec. 31st, 1881.....	296
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The total revenue collected during the year 1881 for water measured by meters and used by hydraulic engines is \$328,000.00, an increase of nearly \$57,000.00 in excess of the amount collected from like sources during 1880.

RIVER TUNNELS.

The nine water pipe tunnels at different points under the river are in good order.

THE LAKE TUNNELS,

as noted in the last report, preparations had been made for examining the old lake tunnel, but owing to the season, the work was suspended until latter part of December last. When the water was pumped out, the tunnel was found to contain a deposit on the bottom, ranging from four to seven inches deep, being much less than was anticipated after a constant use of fourteen years, and not an appreciable obstruction to the flow of water. The tunnel being two miles in length, the removal of the deposit was tedious and required considerable time. The transverse chambers originally used for storing material during the construction of the tunnel, were bricked up. After being thoroughly cleaned from the crib to the shore shafts, his Honor, the Mayor, accompanied by the

city engineers, representatives of the press and others walked through the tunnel from the shore to the crib, making a careful examination of the brick work, which was found without a flaw, damage or wear of any kind. At a point 750 feet distant from shore, Mayor Harrison set a brass tablet in the brick work, on which is inscribed a brief record of the foregoing facts with dates and names.

The descent of the shore shaft a distance of 85 feet, the tramp of two miles within a circle of five feet on an invert, and the ascent of 80 feet on a rope ladder at the crib shaft was a journey that however novel none cared to repeat; especially those of the pilgrims who when standing erect marked six feet. The return trip to the shore was therefore made on a steam tug, through a heavy field of ice, which prevented an entrance to the harbor. The party was landed just inside the end of north pier, from thence creeping over ice-clad piles and other obstructions, the city was reached about dusk. The gates at crib were opened the next day and the tunnel gradually filled with water, which flows to pump wells as usual.

The large tunnel is believed to be in good order.

LAKE CRIB.

It was stated in last report that the crib had up to that time been subjected to a severer test by ice than ever before. The lake was not free from ice in the vicinity of the crib until about the middle of May, and as late as June 1st the crib was again surrounded with a field, after which there was no further trouble.

To keep the openings clear, the services of several men and a steam tug was required most of the time, night and day, during the entire winter.

On the 19th of March, the tug O. B. Green, Capt. Napier, started from the mouth of the harbor for the crib. The ice was very solid, extending as far as the eye could reach;

through a powerful glass, the ice was moving south rapidly. After considerable effort the little steamer was caught in the flow and carried out of sight. Efforts were made to find the boat and rescue the crew, but several days elapsed before the lost tug was discovered off Hyde Park, fortunately the crew escaped with no worse fate than cold and hunger.

In June last the new cupola on top of the crib tower was completed and put in use as a light house. The structure is a great improvement, and shows an excellent light to navigators.

During the fall the parapet and a portion of the walls of four sides forming the superstructure of the crib were taken down for a distance of about eight feet below the top and rebuilt with new stone. The outward curved projection at top of walls was not restored, the face being carried up straight to the coping. The new wall was carefully and thoroughly constructed, and it is believed will stand for many years. Owing to the lateness of the season, the work of rebuilding the side occupied by the keeper's house was deferred; this portion will be completed during the ensuing summer.

The portion of the crib below water has also been examined, both inside and outside, at bottom of lake; from the report of the diver there is no change in that part of the structure since it was last examined.

FULLERTON AVENUE CONDUIT WORKS.

These works have been in operation most of the time during the past year. The principal portion of the water has been delivered from the river into the lake, occasionally, however, when the current from the river north of the works became rapid, the course of the water through the conduit was changed from lake to river.

New and larger force wheels have been prepared and will be put in immediately. Some other changes will be made in the

interior of conduit in connection with the new wheels. The machinery generally will also receive some needed repairs when the works will be again started.

Owing to neglect no record was kept for the month of January. The following record furnished by the engineer in charge, shows in detail the operations of the machinery for eleven months :

The sewer built during the past year on North Park avenue from Clark street to Fullerton avenue connects with the conduit at the latter point. The authority for the use of the conduit to intercept the flow from this sewer was given by the City Council under special restrictions.

TRAFFIC TUNNELS.

The tunnels under the river at Washington and La Salle streets have been greatly improved by being newly paved with wood blocks, and the walls of the covered portion calcimined. La Salle street tunnel is in good order. Some experiments have been made to abate the leakage of water through the walls of Washington street tunnel, but with only partial success.

Both these tunnels are poorly lighted with gas, economy and utility alike demand the substitution of the electric light for gas in these useful thoroughfares.

RIVER.

The water in all the branches of the river has continued in fair condition during the year. The water in the east fork of the south branch, usually very bad, is now much less offensive. The improvement is probably due to the increased marine traffic in this section, growing out of the extensive building of docks and the establishment of large lumber yards, and other important improvements on both banks of this fork. The average stage of water in the river was slightly above that of the previous year, hence vessels have not as a rule been obstructed in their movements on account of the stage of water, which has ranged from $3\frac{8}{10}$ above the plane of city datum to $\frac{4}{10}$ below. In February the high water in the Desplaines river flooded the west fork, raising the level of the south branch for some distance above the docks, creating a very rapid current from the canal to the lake. During this current a tug was employed with a heavy drag passing through the draws of the bridges, for the purpose of aiding the swift current in deepening these channels.

The following table will show in detail the level of the river above "city datum" for each month during the past year.

MONTH.	Highest	Lowest	Mean.	Number of days above mean.
January.....	1.80	0.40	0.94	11
February.....	2.90	0.80	1.23	7
March.....	3.00	1.00	1.64	9
April.....	3.80	1.40	2.12	9
May.....	2.30	1.60	1.93	9
June.....	2.50	1.60	2.11	13
July.....	2.60	0.90	2.09	12
August.....	2.50	1.60	2.04	9
September.....	2.10	1.40	1.81	12
October.....	2.70	1.30	2.13	8
November.....	2.60	0.80	1.90	12
December.....	2.70	1.20	1.85	9
Average.....			1.816	120

DREDGING.

But little dredging has been done during the year. A few yards were dredged from the draws of Division street and Archer avenue bridges, by the city. Considerable work in this line has been done by private parties, mainly alongside the new docks before referred to, built on line of east fork of south branch of river from 33d to 39th streets. The substantial improvements and extensive business interests of this section render it necessary to deepen the channel for a portion of the distance, to allow vessels to reach the docks. It is intended to commence this work and also dredge in the draws of all bridges and other points that require it, as soon as contracts can be made.

SOUTH BRANCH PUMPING WORKS.

As stated in last report, owing to an insufficiency of appropriation for these works nothing could be done toward their construction. In March last, however, an additional appro-

priation was made by the City Council. Soon after proposals were invited for the necessary machinery, and the contract for same was awarded August 31st, to N. F. Palmer, Jr. & Co., of New York. The work to be completed July 1st, 1882. Plans and specifications are prepared for the foundations, buildings and channels, which will be commenced as soon as contract can be made. The new lock for Canal cannot be put in place until the close of navigation next winter; the machinery cannot, therefore, be made available until that time. It is the intention, however, to push the works to completion at the earliest date practicable.

BRIDGES.

Of the thirty-four bridges crossing the river and branches, twenty-two are of iron and wood combined, eleven wholly iron, and one of wood. The bridges have been in use as follows:

Four for a period of fourteen years.

Three for a period of thirteen years.

Three for a period of twelve years.

Four for a period of eleven years.

Ten for a period of ten years.

One for a period of nine years.

Three for a period of eight years.

One for a period of seven years.

Four for a period of five years.

One for a period of one year.

Nine of the bridges are crossed by street railways.

The condition of these structures ranges from fair to good. While some of them need extensive repairs, and others mentioned in former reports are beyond repair and should be replaced with new ones. The same may be said of the respective substructures of the bridges.

No extensive repairs have been made on any of the bridges during the year, beyond the renewal of the floors with plank, and such as have been made necessary on account of damage by collisions of vessels.

The operations of all the bridges cover the entire day of twenty-four hours, as vessels are constantly moving on the river day and night.

During the season of navigation of 1881, the arrivals of vessels at this port were 13,007, and the departures for same period 12,910. Nearly all these vessels required the opening of many of the bridges both upon arrival and departure.

The great number of vessels of large tonnage that pass up and down the river during a season, and the fact that they frequently arrive in large fleets, require their movements to be controlled by experts in order to prevent collisions and damage to the bridges, and also demand watchfulness and care on the part of the bridge tenders, a position which if faithfully filled is no sinecure. The Council order to keep all bridges closed one hour morning and evening was put in force July 9th last.

One new bridge has been erected over the West Fork of the river at Kedzie avenue, to replace an old wooden structure destroyed by the flood in the Spring of 1881.

The new bridge is of wrought iron, with rivited Warren girders. It is 109 feet long with a roadway 16 feet wide in the clear.

The cost of the bridge was.....	\$3,765.00
Temporary wood abutments.....	634.32
Total cost.....	<u>\$4,399.32</u>

The bridge was built by the Massillon Bridge Co., Massillon, Ohio. It is designed to make this a swing bridge in the near future by providing it with a center pier and stone abutments.

A new stone abutment for east end of Polk street is in course of construction and will be completed at an early date.

The approaches of Randolph street bridge, like that of several other bridges, are of wood, in a dilapidated condition, and

should be rebuilt with masonry to render them safe and substantial.

The trusses of Lake street bridge have been moved apart, giving a greater width of roadway to accommodate the passing of cars on the new line of track laid over the bridge by the W. D. R'y Co. The cost of the work was paid by that company.

VIADUCTS.

No extensive repairs have been made on any of these structures during the year, except the renewal of the floors. Some of the viaducts are in bad condition and need replacing with new ones, these were referred to in detail in last report.

The old viaduct on Halsted, crossing 16th street, which was in a dangerous condition has been removed and a new structure erected at this point. The new viaduct is a substantial structure of iron composed of two spans, each $88\frac{1}{2}$ feet long with two roadways, each $21\frac{1}{2}$ feet from center to center of trusses; and two sidewalks, each 8 feet wide, making the total width over all 57 feet. The trusses are of the lattice type with riveted connections. The floor system is composed of wrought iron girders and wood joists on which four inch white pine plank are laid, this being covered with two layers of tarred paper. The roadway is paved with wood blocks four inches deep.

The total weight of iron in the structure is 295,179 pounds, of wood in floor 320,000 pounds, making total weight 615,179 pounds. Weight per lineal foot of viaduct, 3,418 pounds.

The contract was awarded to Leighton Bridge Works, Rochester, N. Y., May 24th, 1881, and the work completed October 25th, 1881.

The cost of viaduct was.....	\$16,990.00
Repairs to abutments and approaches.....	695.73
Total cost	<u>\$17,685.73</u>

Harrison street viaduct referred to and illustrated in last report was fully completed and opened to travel Oct. 25th, last. This structure is one of the most substantial viaducts in the city. It was constructed by Messrs. Rust & Coolidge, of this city.

The cost of the superstructure was	\$49,875.00
The substructure was built by J. J. Kearns, of this	
city, costing	27,839.05
Raising buildings on line of viaduct.....	18,705.25
Making total cost to date	\$96,419.30
Of which the city has paid.....	19,851.75
And the railway companies interested have paid..	\$76,567.55

There are several buildings on line of this viaduct not yet raised to grade, as the owners of them have not accepted the terms proposed by the city.

Sangamon street viaduct, also illustrated and referred to in last report, was fully completed and opened to travel August 20th, last. The superstructure was built by Cunningham & Keepers, of Milwaukee, and the substructure by M. C. & J. Duffy, of this city. The total cost of the work including the raising of buildings on the line was \$98,977.03, of which amount the railway companies paid \$48,847.79.

A new viaduct of wrought iron similar in detail to that at Harrison street is now in course of construction, to be erected over the tracks of C., B. & Q., P., Ft. W. & C. and C. & A. Railway Co.'s, at Polk street. There will be two spans, each 173 feet long with a clear roadway 22 feet wide, and two side-walks $5\frac{1}{2}$ feet wide. The approaches will extend to the bridge, spanning the river at east end and to Clinton street at the west end with two side approaches at Canal street, and one at Ellsworth street.

The Central Iron Works, of Buffalo, N. Y., builds the superstructure and Mr. E. F. Gobel, of this city, builds the substructure, approaches, etc.

The construction of the work is under the direction of this department, the expenses of the entire work is to be paid by the C., B. & Q. Ry. Co. It is expected the viaduct will be completed and open to travel by July next.

In addition to estimates referred to in last report, estimates have been made during the past year by order of council for canals extending from river to lake at 39th street, and at Fullerton Avenue; viaducts over tracks of L. S. & M. S. and C., R. I. & P. Railways at 12th street. Plans and estimates have also been made for a harbor on the lake front, extending from 39th street to the river.

The thanks of this Department are due and are hereby tendered to the Hon. Robt. T. Lincoln, Secretary of War of the U. S., also to Major G. J. Lydecker, U. S. A., in charge of harbor improvements at this port and to Major C. B. Comstock, U. S. A., stationed at Detroit, for copies of lake surveys, and other valued official courtesies extended.

To your Honor, as chief executive and also as acting commissioner of Public Works subsequent to the retirement of Mr. C. S. Waller, as well as to the latter gentleman during his incumbency as commissioner, I am under obligations for a generous co-operation in the discharge of my official duties.

I also take pleasure in recording the faithfulness and industry of the Assistant Engineers, and others connected with the "Engineer Department."

Respectfully submitted,

DEWITT C. CREGIER,
City Engineer.

STREET DEPARTMENT.

CHICAGO, December 31st, 1881.

HON. CARTER H. HARRISON, MAYOR,

In charge of Dep't of Public Works:

SIR: I have the honor to transmit herewith a tabulated statement of the operations of the Street Department for the year ending December 31st, 1881. The year has been an exceedingly busy one, more streets having been improved, probably, than in any previous year in the history of the City. The total number of miles of streets improved was as follows:

Cedar Blocks.....	17.86 miles.
Pine.....	0.34 “
Macadam.....	6.14 “
Medina Stone.....	0.58 “
Asphalt Block.....	0.07 “
Curbing and Filling.....	0.74 “

Total 25.73 miles.

It will be seen from the foregoing table that the largest portion of the streets improved has been with cedar block pavement, which seems to be growing steadily in favor each year, owing perhaps to the fact that it is cheaper than stone, although not as durable, easier kept clean, and not as noisy. One of the first cedar block pavements laid in the city was on Market street, between Madison and Adams streets, in the year 1875, and although it was not laid in the most approved manner, yet after seven years of continual traffic, it stands to-day in comparatively good condition. I have compiled a table showing the number of miles of cedar block pavement laid

in the city each year, from its introduction in 1875 to the present date, which is herewith appended:

1875.....	0.45 miles.
1876.....	1.29 "
1877.....	5.09 "
1878.....	6.55 "
1879.....	5.03 "
1880.....	12.89 "
1881.....	17.86 "
Total.....	49.16 miles.

For a detailed report of the streets improved in each Division, your attention is respectfully called to the following table:

REPORT OF SIREETS IMPROVED IN THE SOUTH DIVISION DURING THE YEAR 1881

[illegible]

Streets marked thus * were improved by private contract.

11 $\frac{77}{100}$ miles.

REPORT OF STREETS IMPROVED IN THE WEST DIVISION DURING THE YEAR 1881.

STREETS.	FROM.	TO.	When Commenced	When Finished	CONTRACTORS	NATURE OF IMPROVEMENT	Square Yards.	Linear Feet.
Ashland avenue.	Congress street.	Twelfth street.	July 28.	Unfin'd.	James B. Barnet.	Macadam, cobble stone gutters.	3,133.00	3,360.00
Bryan place.	Randolph street.	Lake street.	June 29.	June 27.	J. B. Smith & Co.	8-in. cedar on 1-in. pine floor.	600.00	600.00
Clinton street E. ½	Adams street.	Alley north.	July 29.	July 30.	A. L. Amberg & Co.	" " 1-in. " "	320.00	180.00
Fulton street.	Union street.	Sangamon street.	May 10.	June 13.	J. P. Dickey.	" " 1-in. " "	1,557.00	1,558.00
Harrison street.	Centre avenue.	Canal street.	June 14.	June 23.	J. P. Dickey.	" " 1-in. " "	1,790.00	318.00
Harrison street.	Centre avenue.	Clinton street.	July 12.	Aug. 22.	A. J. McBean.	" " 2-in. hemlock floor.	19,356.00	4,384.00
Indiana street.	Halsted street.	Ashland avenue.	July 12.	Unfin'd.	Thomas H. Duffy.	Macadam, cobble stone gutters.	2,005.00	2,005.00
Indiana street.	Halsted street.	Viaduct.	June 28.	July 15.	James B. Barnet.	7-in. cedar on 2-in. hemlock floor.	5,220.00	979.00
Jackson street.	Taylor street.	Twelfth street.	July 9.	Oct. 15.	A. L. Amberg & Co.	Curb and filling.	794.00	794.00
Jackson street.	Hoyle avenue.	Rockwell street.	Nov. 20.	July 6.	R. F. Conway.	Macadam, cobble stone gutters.	3,544.00	3,544.00
Lake street.	Canal street.	Halsted street.	May 28.	June 30.	J. G. McBean.	8-in. cedar on 1-in. pine floor.	7,226.00	2,039.00
Loomis street.	Halsted street.	Ashland avenue.	June 21.	Aug. 6.	J. G. McBean.	" " 2-in. hemlock floor.	30,377.00	5,330.00
Lincoln street.	Madison street.	Van Buren street.	July 27.	Aug. 19.	James B. Barnet.	" " 2-in. " "	8	1,022.00
Lincoln street.	Indiana street.	Adams street.	Sept. 13.	Unfin'd.	R. F. Conway.	Macadam, cobble stone gutters.	3,551.00	3,551.00
Madison street.	Jackson street.	Ogden avenue.	Aug. 5.	Dec. 1.	J. B. Smith & Co.	Curb and filling.	941.00	941.00
Madison street.	Sangamon street.	Halsted street.	May 9.	June 16.	James Kincaid.	8-in. cedar on 1-in. pine floor.	3,863.00	985.00
O'Brien street.	Hamilton street.	Homan avenue.	July 27.	Sept. 24.	McAdam & Sarl.	Macadam, cobble stone gutters.	2,644.00	2,644.00
Randolph street.	Halsted street.	Jefferson street.	June 31.	Dec. 31.	A. L. Amberg & Co.	Curb and filling.	1,218.00	1,218.00
Randolph street.	Lake street.	Desplains street.	Aug. 22.	Sept. 9.	Robert McClelland.	Walling.	9,926.00	318.00
Robey street.	Lake street.	Harrison street.	Oct. 15.	Aug. 26.	A. J. McBean.	7-in. cedar on 2-in. hemlock floor.	754.00	754.00
Van Buren street.	Halsted street.	Canal street.	Aug. 23.	Sept. 6.	J. & M. C. Duffy.	Macadam, cobble stone gutters.	3,805.00	3,805.00
Wood street.	Lake street.	Van Buren street.	Sept. 9.	Nov. 10.	A. J. McBean.	7-in. cedar on 2-in. hemlock floor.	5,390.00	2,107.00
Warren avenue.	Oakley avenue.	Rockwell street.	Nov. 29.	June 29.	J. B. Smith & Co.	" " 1-in. pine floor.	13,545.00	2,131.00
Washington street.	Clinton street.	W. Water street.	June 18.	June 29.	R. F. Conway.	Macadam, asphalt gutters.	2,453.00	544.00
Approaches to Sangamon st. viaduct.			June 18.	June 29.	J. B. Smith & Co.	7-in. cedar on 2-in. hemlock floor.	2,453.00	544.00
Approaches to Harrison st. viaduct.			June 18.	June 29.	J. & M. C. Duffy.	6-in. pine on 1-in. pine floor.	2,558.00	606.00
			August.	August.	J. B. Smith & Co.	6-in. " " 2-in. " "	5,778.00	1,301.00
							113,981.00	51,860.00

9 ⁸/₁₀ Miles.

$4\frac{14}{100}$ Miles.

Streets marked * were improved by private contract.

The total number of miles of improved streets swept and cleaned during the year is shown in the following exhibit.

STREET CLEANING, 1881.

DIVISION.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
South	40.12	86.80	155.87	143.04	92.92	80.30	34.06	34.74	667.85
West.....	35.27	46.25	47.96	75.45	36.49	4.28	3.05	26.38	275.13
North.....	14.14	35.80	32.47	45.79	27.81		12.04	12.02	190.07
Total miles..	89.53	168.85	236.30	264.28	157.22	84.58	49.15	73.14	1,123.05

The unimproved streets have been graded and ditched as often as it was possible to do, taking into consideration the amount of money appropriated for that purpose.

THE PARKS.

No improvements of note have been done in the parks during the past year, the amount expended being for maintenance only.

LAMP DEPARTMENT.

For a statement in detail of the work performed during the year under the head of this department, your attention is respectfully called to the following report of Superintendent Stewart.

CHICAGO, Dec. 31st, 1881.

WILLIAM FOGARTY, Esq.,

Superintendent of Streets, etc.

DEAR SIR: I present herewith the report of the lamp department for the year ending December 31st, 1881.

At the end of the year there were 11,344 gas lamps in the city, an addition of 264 lamps during the year, 574 oil lamps were erected, being the first used by the city.

The following statement will show the number of lamps in each division.

STREET DEPARTMENT.

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GAS LAMPS.

West Division, Jan. 1st, 1881.....	5,656	
“ Added during 1881.....	196	5,852
South Division, Jan. 1st, 1881....	3,153	
“ Added during 1881.....	18	3,171
North Division, Jan. 1st, 1881.....	2,271	
“ Added during 1881.....	50	2,321
		11,344

OIL LAMPS.

West Division.....	257
South Division.....	97
North Division.....	220
	574

The total number of lamps glazed, repaired and renewed aggregated 20,673.

The whole number of lamps repaired with glass on streets amounted to 18,220.

The number of lamps on which tin work was repaired and painted was 798.

The number of three-quarter lamps made, or all new except a portion of the top, was 357.

The number of new lamps made for inside of blocks was 849.

The number of corner lamps with street guide was 449.

The number of lamps condemned during the year and replaced by new ones was 1,298.

The number of “Stewart” patent lamps in the city was 5,345 gas lamps and 574 oil lamps. Total 5,919, about one-half of the whole number in the city.

The number of corner lamps in the city with street guide was 1,601.

The average number of lamps in which glass was broken was 50 per day.

The number of lamp posts and lanterns broken by accidents during the year was 189.

There was used for glazing new lamps 5,192 top lights, 1,298 door lights, 3,879 side lights.

There was used for repairing or replacing in old lamps 5,752 top lights, 5,428 door lights, 14,436 side lights.

The number of lamps made for special assessment department was 264.

Number of gas burners used to replace old ones on street lamps was 14 gross checks, 35 gross pillars, 55 gross lava tips.

All the work of repairing and making lamps has for the past four years been done in the city's own shop, the business is kept close up and all work done is in the most thorough manner.

The following statement will show the number of lamps in the city the past six years, or since the organization of the Department of Public Works.

Number of lamps in city Jan. 1st 1876:			
West Division.....	5,160		
" Added during 1876.....	202	5,362	
South Division.....	2,965		
" Added during 1876.....	92	3,057	
North Division.....	2,095		
" Added during 1876.....	39	2,134	
			10,553

STREET DEPARTMENT.

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Number of lamps in city Jan 1st, 1877:

West Division	5,362	
" Added during 1877	77	5,439
South Division.....	3,057	
" Added during 1877	47	3,104
North Division.....	2,134	
" Added during 1877.....	34	2,168
		10,711

Number of lamps in city Jan. 1st, 1878:

West Division	5,439	
" Added during 1878.....	42	5,481
South Division.....	3,104	
" Added during 1878	17	3,121
North Division.....	2,168	
" Added during 1878	15	2,183
		10,785

Number of lamps in city Jan. 1st, 1879:

West Division	5,481	
" Added during 1879.....	38	5,519
South Division.....	3,121	
" Added during 1879.....	1	3,122
North Division.....	2,183	
" Added during 1879.....	58	2,241
		10,882

Number of lamps in city Jan. 1st, 1880:

West Division.....	5,519	
" Added during 1880.....	137	5,656
South Division.....	3,122	
" Added during 1880	31	3,153
North Division.....	2,241	
" Added during 1880.....	30	2,271
		11,080

Number of lamps in city Jan. 1st, 1881:			
West Division.....	5,656		
" Added during 1881.....	196	5,852	
South Division.....	3,153		
" Added during 1881.....	18	3,171	
North Division.....	2,271		
" Added during 1881.....	50	2,321	
			11,344
Total added during the years:			
West Division.....		692	
South Division		206	
North Division		226	
			1,124
Total number of lai 1st, 1876.....		10,220	
Total number in city Jan.			11,344

The gas fitting on Sangamon and Harrison street viaducts, done under the supervision of this department, was charged to this department and credited back, having been paid for by the contractors, and consequently does not appear in this report.

Respectfully submitted,

JOHN STEWART,
In charge Lamp Department.

The following table shows the amount of lumber used by the carpenters and pavers, and for what purpose.

FOR WHAT USED.	SOUTH DIVISION.				WEST DIVISION.				NORTH DIVISION.			
	No.	Sq. yds.	Pine.	Oak.	No.	Sq. yds.	Pine.	Oak.	No.	Sq. yds.	Pine.	Oak.
Aprons	936		69,861		1,923		96,084		386		23,500	
Crossings	356		41,325 19,442		683		84,530	35,274	175		10,450	5,969
Cuttings	155		28,725 10,187		306		58,586 13,855	74	74		6,139	2,144
General repairs	8,923		61,464 7,655		10,500		18,371 25,304		5,548		18,880	3,620
Gas Co	732				645				388			
Sewerage department	38				133				32			
Water department	2,506		9,684		6,897		13,000		75			
Street permits	2,109				1,642				472			
Drain boxes			984				2,844				908	
General repairs (sidewalks)			41,348				184,381				5,220	
Slopes (sidewalks)			812				1,549				2,586	
Railings (sidewalks)			755				2,492				2,103	
Intersections (sidewalks)			12,150				60,695				10,088	
Approach to bridges			178 26,105				736	74,300				
Sidewalks, special permits			33,310				67,109					
Total	1,439	13,591	295,596	63,389	2,111	19,727	589,097	148,733	655	6,415	85,943	11,742

SIDEWALKS.

The following statement shows in detail the amount of walk built during the year :

SOUTH DIVISION.

MATERIAL.	LINEAL FEET.	LINEAL MILES.
Wood.....	112,421.....	21. $\frac{29}{100}$
Stone.....	28,340.....	5. $\frac{37}{100}$
Concrete.....	.....	2. $\frac{16}{100}$
Total.....	.....	28. $\frac{82}{100}$

WEST DIVISION.

MATERIAL.	LINEAL FEET.	LINEAL MILES.
Wood.....		58. $\frac{26}{100}$
Stone.....		0. $\frac{61}{100}$
Concrete.....		0. $\frac{16}{100}$

Total.....59. $\frac{03}{100}$

NORTH DIVISION.

MATERIAL.	LINEAL FEET.	LINEAL MILES.
Wood.....	125,362.....	23. $\frac{74}{100}$
Stone.....	2,793.....	0. $\frac{63}{100}$
Concrete.....	1,414.....	0. $\frac{27}{100}$
Total.....	.....	24. $\frac{64}{100}$

There has also been repaired during the year 25. $\frac{31}{100}$ miles of sidewalk in the different divisions of the city, as follows :

	MILES.
South Division.....	3. $\frac{86}{100}$
West Division.....	18. $\frac{23}{100}$
North Division.....	2. $\frac{52}{100}$
Total.....	25. $\frac{31}{100}$

The total amount of walks built and repaired was $137\frac{70}{100}$ miles; of this amount there was built where walks never previously existed $14\frac{11}{100}$ miles, making the grand total amount of walks in the city at this date $734\frac{78}{100}$ miles, divided as follows:

	MILES.
Stone	$36\frac{17}{100}$
Concrete	$8\frac{09}{100}$
Wood	$690\frac{50}{100}$
Total	$734\frac{78}{100}$

Respectfully submitted,

WILLIAM FOGARTY,

Supt. of Streets.

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SPECIAL ASSESSMENT DEPARTMENT.

CHICAGO, December 31, 1881.

HON. CARTER H. HARRISON,

In charge Department of Public Works.

DEAR SIR: I submit herewith, in tabular form, a statement of special assessments made in this department during the past year, with a summary of the estimated cost of the same; also, a recapitulation of the number of miles of street improvement of the various kinds, the number of lamp posts in the city, and the amount of special assessments made in each year during the past twenty-one years:

STATEMENT OF ASSESSMENTS FOR WOODEN BLOCK PAVEMENT.

No. War- rant.	NAME OF STREET.	FROM	TO	AMOUNT.
3652	Lincoln street.....	West Jackson street...	Ogden avenue.....	\$ 7,846 38
6	Twentieth street.....	State street.....	Archer avenue.....	7,689 07
3661	Loomis street.....	125 ft. N. of Congress st	West Twelfth street...	26,968 97
3	Douglas avenue.....	South Park avenue.....	East terminus.....	15,237 63
3672	West Washington st.	Clinton street.....	West Water street.....	3,282 56
3	West Indiana street.	Desplaines street.....	Halsted street.....	6,890 74
5	West Lake street.....	Canal street.....	Halsted street.....	13,598 89
6	LaSalle street.....	Adams street.....	Quincy street.....	2,721 86
3690	Kinzie street.....	North Clark street.....	North LaSalle street...	2,461 43
1	Loomis street.....	West Madison street...	West Van Buren street	10,804 04
2	Erie street, S. L.....	North Clark street.....	St. Clair street.....	3,971 62
4	West Harrison street.	Clinton street.....	Centre avenue.....	25,611 27
3700	South Park avenue...	Twenty-second street...	Douglas avenue.....	45,774 74
2	Quincy street.....	LaSalle street.....	Market street.....	6,339 44
5	Monroe street.....	Michigan avenue.....	Alley west.....	1,439 79
6	Egan avenue.....	Cottage Grove avenue...	Lake avenue.....	5,965 00
8	Lake avenue.....	Douglas avenue.....	Oakwood avenue.....	15,438 06
3710	Charles place.....	Franklin street.....	Fifth avenue.....	2,999 93
11	Market street.....	Van Buren street.....	Congress street.....	3,591 03
17	Rhodes avenue.....	Douglas avenue.....	University place.....	2,408 84
18	West Van Buren st...	Canal street.....	Halsted street.....	7,490 28
3720	Congress street.....	Market street.....	Fifth avenue.....	5,517 62
8	Michigan street.....	Cass street.....	St. Clair street.....	10,667 03
3739	Chicago avenue.....	North Clark street...	Pine street.....	19,440 77
3740	Pine street.....	Michigan street.....	Huron street.....	8,557 71
2	Third avenue.....	Jackson street.....	Twelfth street.....	21,176 89
3	Fourth avenue.....	Jackson street.....	Twelfth street.....	18,632 92
4	Groveland Park ave...	Twenty-ninth street...	Thirtieth street.....	5,791 08
		Carried forward.....		\$308,255 59

STATEMENT OF ASSESSMENTS FOR WOODEN BLOCK PAVEMENT. Contin'd.

War- rant.	NAME OF STREET.	FROM	TO	AMOUNT.
		Brought forward.....		\$308,355 59
3751	West Lake street.....	Halsted street.....	Ashland avenue.....	27,842 51
3772	Eugenie street.....	North Clark street.....	North Wells street.....	3,389 10
8	State street.....	Taylor street.....	Twenty-second street.....	87,097 89
9	State street.....	Twenty-second street.....	Thirty-first street.....	74,023 63
3780	State street.....	Thirty-first street.....	Egan avenue.....	72,905 67
3807	Thirty-first street.....	State street.....	South Park avenue.....	15,058 85
3820	West Division street.....	Milwaukee ave.....	Lincoln street.....	23,976 62
3824	Twenty-second street.....	State street.....	South Park avenue.....	22,757 15
3825	Calumet avenue.....	Twenty-third street.....	Twenty-ninth street.....	15,846 77
3840	School street.....	E. L. B. I. Sch. Sec.....	West terminus.....	958 40
3851	Superior street.....	North Wells street.....	Pine street.....	16,589 97
3852	Huron street.....	North Clark street.....	North State street.....	5,930 52
3881	N. LaSalle st.....	Chicago avenue.....	North Clark street.....	7,931 74
3892	N. LaSalle st., S. L.....	Michigan street.....	Chicago avenue.....	9,029 07
3953	Union street.....	West Madison street.....	Carroll avenue.....	12,003 12
3959	Wentworth avenue.....	Twenty-ninth street.....	Thirty-third street.....	5,599.72
		Total.....		\$709,196 32

STATEMENT OF ASSESSMENTS FOR MISCELLANEOUS STREET IMPROVEMENTS.

No. War- rant.	NATURE OF IMPROVEMENT.	NAME OF STREET.	FROM	TO	Amount.
3651	Macadamizing.....	Honore street.....	W. Madison st.....	W. Adams street.....	\$ 1,969 75
2657	".....	Lincoln street.....	W. Adams street.....	W. Indiana street.....	24,331 10
3658	".....	Hubbard court.....	State street.....	Michigan avenue.....	4,231 77
3659	".....	Lincoln street.....	W. Indiana st.....	W. Chicago ave.....	12,275 51
3695	".....	Thirty-seventh st.....	Cottage Grove av.....	Lake avenue.....	4,001 67
3701	".....	Ellis avenue.....	Douglas avenue.....	Egan avenue.....	15,395 09
3703	Stone.....	Quincy street.....	Clark street.....	LaSalle street.....	2,297 70
3704	Macadamizing.....	Ashland avenue.....	W. Congress st.....	W. Twelfth street.....	26,857 34
3707	Stone.....	Franklin street.....	Lake street.....	S. Water street.....	4,919 94
3709	".....	LaSalle street.....	Lake street.....	S. Water street.....	4,873 69
3712	Macadamizing.....	Fourteenth street.....	State street.....	Indiana avenue.....	5,949 44
3714	".....	Calumet avenue.....	Twentieth street.....	Twenty-first st.....	2,545 18
3716	".....	Twenty-eighth st.....	State street.....	Wabash avenue.....	2,492 03
3721	".....	Prairie avenue.....	Thirty-first street.....	Thirty-third st.....	9,223 58
3722	Asphalt.....	Twenty-eighth st.....	Wabash avenue.....	Michigan avenue.....	4,311 47
3723	Macadamizing.....	Twenty-first st.....	Michigan avenue.....	Calumet avenue.....	7,555 44
2729	Curb'g & Filling.....	West Quincy st.....	Clinton street.....	Jefferson street.....	1,186 35
3730	Asphalt.....	Indiana avenue.....	Twenty-ninth st.....	Thirtieth street.....	8,799 37
3735	Macadamizing.....	Thirty-first street.....	Cottage Grove av.....	South Park ave.....	5,855 45
3736	".....	Indiana avenue.....	Fourteenth street.....	Eighteenth st.....	17,249 80
3737	Stone.....	Twelfth street.....	Wabash avenue.....	Clark street.....	14,233 16
3738	".....	E. 1/4 Dearborn st.....	Adams street.....	Jackson street.....	3,917 89
3741	Asphalt.....	Alley.....	N. LaSalle street.....	N. State street.....	3,463 80
3748	Stone.....	Court place.....	Franklin street.....	Market street.....	1,709 57
3749	".....	Calhoun place.....	Dearborn street.....	State street.....	1,735 32
3752	Macadamizing.....	Warren avenue.....	Oakley avenue.....	P.C. & St. L. R. R.....	15,024 85
3757	".....	W. Harrison st.....	Centre avenue.....	Ogden avenue.....	41,879 89
3805	".....	W. Madison st.....	Homan avenue.....	Hamlin avenue.....	19,950 12
3821	Curb'g & Filling.....	Centre avenue.....	W. Van Buren st.....	Blue Island ave.....	11,334 39
3822	Macadamizing.....	".....	Blue Island ave.....	W. Twenty-sec. st.....	25,958 49
3823	".....	Forrest avenue.....	Thirty-first street.....	Douglas avenue.....	20,484 98
3846	Curb'g & Filling.....	Seventeenth st.....	State street.....	Clark street.....	6,758 26
3859	Filling.....	Woodbine place.....	Leavitt street.....	Oakley avenue.....	712 62
3955	Macad g. (Insuf.).....	Eighteenth street.....	Indiana avenue.....	Calumet avenue.....	1,160 01
3956	".....	Calumet avenue.....	Eighteenth street.....	Twentieth street.....	1,536 98
		Total.....			\$336,172 00

STATEMENT OF ASSESSMENT FOR LAYING PRIVATE DRAINS.

No. War- rant.	NAME OF STREET.	FROM	TO	AMOUNT.
3664	W. Division street.	Milwaukee avenue	Lincoln street.	\$ 1,543 75
3665	Hubbard street.	Desplaines street.	Ashland avenue.	1,763 75
3666	Thirty-first street.	Cottage Grove avenue.	South Park avenue.	399 00
3668	Park avenue.	Western avenue.	P. C. & St. L. R. R.	1,206 00
3725	Thirty-first street.	State street.	South Park avenue.	422 50
3726	Thirty-second street.	State street.	South Park avenue.	120 00
3727	Calumet avenue.	Twentieth street.	Twenty-first street.	451 00
3731	Rhodes avenue.	Douglas avenue.	University place.	179 00
3745	Warren avenue.	Oakley avenue.	P. C. & St. L. R. R.	1,437 00
3746	W. Harrison street.	Centre avenue.	Ogden avenue.	2,653 00
3747	W. Indiana street.	Hoynes avenue.	Western avenue.	1,792 75
3768	Twenty-sixth street.	State street.	South Park avenue.	526 50
3769	Carpenter street.	Milwaukee avenue.	George street.	351 50
3770	Wood street.	W. Lake street.	W. Van Buren street.	504 00
3771	Oak street.	Dearborn avenue.	L. S. Drive.	798 00
3773	Hanover street.	Archer avenue.	Twenty-ninth street.	697 00
3774	Wentworth avenue.	Archer avenue.	Twenty-second street.	140 00
3775	N. Centre avenue.	Hubbard street.	W. Chicago avenue.	731 00
3776	Groveland Park ave.	Twenty-ninth street.	Thirtieth street.	1,239 00
3777	Maxwell street.	Canal street.	Halsted street.	444 00
3800	State street.	Taylor street.	Twenty-second street.	4,017 50
3801	State street.	Twenty-second street.	Thirty-first street.	3,940 50
3802	State street.	Thirty-first street.	Thirty-ninth street.	7,352 00
3803	Canal street.	W. Lake street.	W. Kenzie street.	232 50
3804	Astor street.	Division street.	S. Hiller street.	1,314 00
3835	Centre avenue.	W. Madison st.	Blue Island avenue.	1,757 25
3836	Michigan avenue.	Twenty-sixth street.	Douglas avenue.	1,423 00
3837	Indiana avenue.	Fourteenth street.	Eighteenth street.	1,022 40
3838	Douglas avenue.	Michigan avenue.	South Park avenue.	2,232 00
3839	Michigan avenue.	Lake Park avenue.	Twenty-sixth street.	2,049 00
3878	Thirty-third street.	South Park avenue.	E. terminus.	1,066 00
3880	Superior street.	N. Wells street.	Pine street.	532 00
3882	W. Washington st.	Ashland avenue.	Falls street.	1,638 00
3954	W. Nineteenth st.	Halsted street.	Centre avenue.	558 00
				\$ 46,522 90

STATEMENT OF ASSESSMENTS FOR LAYING WATER SERVICE PIPES.

No. War- rant.	NAME OF STREET.	FROM	TO	AMOUNT.
3684	N. La Salle street.	Chicago avenue	N. Clark street.	\$ 808 25
3685	Canal street.	W. Lake street.	W. Kinzie street.	750 00
3686	Twelfth street.	Fourth avenue.	Michigan avenue.	285 30
3693	Wood street.	W. Lake street.	W. Van Buren street.	474 60
3698	Ashland avenue.	W. Congress st.	W. Twelfth street.	3,895 50
3699	Pine street.	Michigan street.	Huron street.	303 75
3758	Market street.	Van Buren street.	Congress street.	318 00
3759	Charles place.	Franklin street.	Fifth avenue.	318 00
3760	Indiana avenue.	Fourteenth street.	Eighteenth street.	1,138 05
3761	Fourteenth street.	State street.	Indiana street.	253 00
3762	W. Harrison street.	Centre avenue.	Ogden avenue.	3,294 00
3763	Calumet avenue.	Twentieth street.	Twenty-first street.	449 00
3764	Twenty-second st.	State street.	South Park avenue.	975 50
3765	Thirty-first street.	State street.	South Park avenue.	323 90
3766	Hanover street.	Archer avenue.	Twenty-ninth street.	1,028 00
3767	Rhodes avenue.	Douglas avenue.	University place.	100 00
3782	State street.	Thirty-first street.	Egan avenue.	5,604 00
3783	State street.	Twenty-second street.	Thirty-first street.	3,894 00
3784	State street.	Taylor street.	Twenty-second street.	5,778 40
3785	Eugenie street.	N. Clark street.	N. Wells street.	85 00
3786	N. Centre avenue.	Hubbard street.	W. Chicago avenue.	1,257 00
3787	Oak street.	Dearborn street.	L. S. Drive.	1,371 50
3788	W. Van Buren st.	Canal street.	Halsted street.	1,144 00
3789	Maxwell street.	Canal street.	Halsted street.	476 00
Carried forward.				\$ 34,224 75

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STATEMENT OF ASSESSMENTS FOR LAYING WATER SERVICE PIPES.
(CONTINUED.)

No. Warrant.	NAME OF STREET.	FROM	TO	AMOUNT.
		Brought forward		\$ 34,224 75
3790	W. Indiana street	Hoyne avenue	Western avenue	2,167 50
3791	Chicago avenue	N. Clark street	Pine street	543 00
3792	Centre avenue	W. Madison street	Blue Island avenue	1,772 00
3793	Calumet avenue	Twenty third street	Twenty-ninth street	205 50
3794	Groveland Park ave.	Twenty-ninth street	Thirtieth street	1,312 30
3795	Astor street	Division street	Schiller street	1,016 55
3796	W. Quincy street	Clinton street	Jefferson street	375 00
3797	Morgan street	W. Madison street	W. Washington street	161 00
3798	Carpenter street	Milwaukee avenue	George street	580 50
3799	Warren avenue	Oakley avenue	P. C. & St. L. R. R.	1,974 00
3832	Michigan avenue	Jackson street	Douglas avenue	4,400 45
3833	Douglas avenue	Michigan avenue	South Park ave.	1,180 50
3879	Thirty-third street	State street	E. terminus	589 50
3887	Seventeenth street	State street	Clark street	338 00
3888	S. Dearborn street	Sixteenth street	Twenty-second street	1,272 00
3889	N. Clark street	Chicago avenue	Division street	657 00
3890	Curtis street	W. Madison street	Fuller street	620 00
3957	May street	W. Madison street	W. Indiana street	1,162 00
				\$ 54,551 45

STATEMENT OF ASSESSMENTS FOR STREET AND ALLEY OPENINGS
AND WIDENINGS.

No. Warrant.	NATURE OF IMPROVEMENT.	NAME OF STREET.	FROM	TO	AMOUNT.
3674	Widening	Halsted street	C. A. & St. L. R'y.	Archer avenue	\$ 4,641 28
3732	Opening	Irving place	N. terminus	W. Monroe st.	5,855 23
3733	"	Church street	S. terminus	Sigel street	8,459 96
3826	"	Aldine street	N. 1 Lot 11, B 3.		
			Ellis	Egan avenue	8,487 86
3827	"	Idaho street	S. terminus	W. Taylor st.	3,066 90
3828	"	Grovel'd P'k av	N. terminus	Twenty-eighth st.	4,656 18
3829	"	Vernon avenue	Through Lot 6	S. E. 1/4 Sec. 27	1,406 30
3830	"	Alley	Springer ave	S. 1 Bl'k 7, Sec 32	508 43
3831	Widening	Washtenaw ave	Through to	W. Lake st.	2,257 70
3896	Extending	W. Indiana st.	Western avenue	Grand avenue	3,368 10
					\$ 42,677 94

STATEMENT OF ASSESSMENTS FOR THE CONSTRUCTION OF SIDEWALKS.

No. Warrant.	Side of Street.	NAME OF STREET.	FROM	TO	AMOUNT.
3662	W	California avenue	W. Van Buren st.	W. Twelfth street	\$ 416 67
3677	B	Thirty-third street	South Park ave.	Lake Park avenue	64 23
3678	E	Keeley street	Archer avenue	Lyman street	84 48
3679	B	Arch street	Archer avenue	Lyman street	122 88
3680	B	Lyman street	Keeley street	Lock street	474 78
3681	E	Davis street	North avenue	Waubansia avenue	147 52
3682	B	Johnson street	W. Twelfth street	Maxwell street	94 40
3687	E	Haynes court	Archer avenue	Lyman street	121 70
3688	B	Springer street	Waterville street	Ullman street	102 08
3689	E	Elk Grove street	Waubansia avenue	North avenue	120 32
3834	E	Ullman street	Thirty-third street	Thirty-fourth street	224 14
3863	S	W. Twelfth st.	Wood street	Robey street	186 00
3865	B	Vernon avenue	Twenty-ninth street	Thirty-first street	136 71
3866	B	South Park ave.	Twenty-sixth street	Thirty-first street	256 83
3867	B	Prairie avenue	Douglas avenue	Egan avenue	314 70
			Carried forward		\$ 2,867 34

STATEMENT OF ASSESSMENTS FOR THE CONSTRUCTION OF SIDEWALKS.
CONTINUED.

No. of War-rant.	Side of Street.	NAME OF STREET.	FROM	TO	AMOUNT.
			Brought forward.		\$ 2,867 34
3868	B	Thirtieth street.	Prairie avenue.	L. S. & M. S. R. R.	404 40
3869	E	Michigan avenue.	Thirty-seventh street.	Egan avenue.	278 10
3870	B	Twenty-sixth st.	Cottage Grove ave.	L. S. & M. S. R. R.	298 01
3871	B	Johnson place.	North terminus.	Egan avenue.	242 86
3872	B	Wallace street.	McGregor street.	Twenty-sixth street.	144 46
3873	B	West Ohio street.	Milwaukee avenue.	Western avenue.	1,047 19
3874	B	Kossuth street.	Emerald avenue.	Sanger street.	69 12
3875	B	Lincoln street.	W. Twelfth street.	Blue Island avenue.	806 78
3876	N	West Taylor street.	Ashland avenue.	Ogden avenue.	470 56
3877	E	Indiana avenue.	Fourteenth street.	Sixteenth street.	156 86
3897	B	Wabash avenue.	Twenty-sixth street.	Thirty second street.	796 79
3898	S	Flournoy street.	Rockwell street.	Washtenaw avenue.	130 90
3899	E	Calumet avenue.	Twenty-sixth street.	Twenty-ninth street.	202 74
3900	N	Twenty-eighth st.	Shields avenue.	Stewart avenue.	87 37
3901	B	Thirty-eighth st.	Vincennes avenue.	Cottage Grove ave.	183 26
3902	N	Kossuth street.	Sanger street.	Wallace street.	149 94
3903	N	Egan avenue.	Cottage Grove ave.	State street.	467 28
3904	E	Ashland avenue.	W. Madison street.	W. Van Buren street.	149 40
3905	B	Blanche street.	Ashland avenue.	Noble street.	554 21
3906	W	Emerald avenue.	Archer avenue.	Twenty-sixth street.	129 54
3907	B	Thirty-sixth street.	Archer avenue.	Western avenue.	346 50
3908	B	Jefferson street.	W. Sixteenth street.	W. Twenty-second st.	880 32
3909	B	Twenty-fifth street.	Stewart avenue.	Sanger street.	410 49
3910	B	Thirty-first street.	State street.	Stewart avenue.	329 18
3911	B	Douglas avenue.	East terminus.	L. S. & M. S. R. R.	642 73
3912	B	West Taylor street.	Canal street.	Halsted street.	235 16
3913	B	Forest avenue.	Thirty-third street.	Douglas avenue.	283 14
3914	S	Bushnell street.	Stewart avenue.	Wentworth avenue.	297 00
3915	B	Clinton street.	W. Madison street.	W. Harrison street.	942 32
3916	B	Jefferson street.	W. Madison street.	W. Harrison street.	999 62
3917	B	Jefferson street.	W. Twelfth street.	Meagher street.	1,273 17
3918	B	Tilden street.	Bowery street.	Aberdeen street.	90 89
3919	B	West Congress st.	Western avenue.	Rockwell street.	77 70
3920	B	Ashland avenue.	Archer avenue.	Thirty-third street.	207 40
3921	B	Thirty-first street.	Halsted street.	S. Br. Chicago river.	942 70
3922	B	Thirty-third street.	Ashland avenue.	Jones street.	198 22
3923	B	Blanche street.	Fleetwood street.	Noble street.	300 96
3924	B	Mather street.	Desplaines street.	Halsted street.	114 48
3925	B	Sacramento street.	W. Madison street.	W. Washington st.	378 18
3926	B	W. Van Buren st.	Halsted street.	Ashland avenue.	529 20
3927	B	Winchester avenue.	W. Madison street.	W. Harrison street.	87 59
3928	S	Ferdinand street.	Lincoln street.	Leavitt street.	255 36
3929	B	May street.	W. Madison street.	Milwaukee avenue.	866 83
3930	E	Washtenaw avenue.	W. Jackson street.	W. Van Buren street.	127 50
3931	B	Throop street.	W. Adams street.	W. Van Buren street.	180 42
3932	B	W. Thirteenth st.	Blue Island avenue.	Lincoln street.	619 41
3933	B	Thirteenth place.	Blue Island avenue.	Lincoln street.	347 82
3934	B	Kramer street.	Jefferson street.	Halsted street.	129 05
3935	B	Sholto street.	W. Harrison street.	Eleventh street.	108 60
3936	B	Damon street.	Sholto street.	May street.	126 48
3937	B	Campbell avenue.	W. Madison street.	West Polk street.	307 79
3938	B	Wentworth avenue.	Thirty-third street.	Egan avenue.	651 86
3939	B	Indiana avenue.	Twenty-sixth street.	Thirty-first street.	539 97
3940	W	Lake Park avenue.	Thirty-first street.	Thirty-third street.	403 22
3941	W	Poplar street.	Thirty-first street.	Wrong street.	308 55
3942	B	Thirty-second st.	Halsted street.	Laurel street.	639 10
3943	S	Douglas avenue.	Portland avenue.	Stewart avenue.	213 18
3944	E	Western avenue.	W. Twenty-second st.	S. Br. Chicago river.	539 88
3945	B	W. Fifteenth street.	Canal street.	Stewart avenue.	126 44
3946	W	Blue Island avenue.	W. Twenty-first st.	W. Twenty-second st.	217 80
3947	B	Tucker street.	Thirty-seventh street.	Thirty-eighth street.	348 50
3948	B	Margaret street.	W. Fourteenth st.	W. Fifteenth street.	123 42
3949	B	Brown street.	W. Fourteenth st.	W. Sixteenth street.	344 19
3950	B	West Adams street.	Ashland avenue.	Western avenue.	395 40
3951	B	Washtenaw avenue.	North avenue.	Hirch street.	160 14
3952	W	Thirty-seventh st.	State street.	Halsted street.	709 26
3958	B	W. Nineteenth st.	Union street.	Western avenue.	2,601 78
					30,501 11

STATEMENT OF ASSESSMENTS FOR THE ERECTION OF OIL
LAMP POSTS.

No. of posts.	No. of posts.	NAME OF STREET.	FROM	TO	AMOUNT.
3007	1	Hyman street	Belmont street	35 feet north	\$ 57 30
3008	1	Hyman place	North Clark street	Deansboro avenue	38 40
3009	1	West Congress street	Hyman street	Hyman street	200 00
3010	1	Thirtieth street	Belmont street	Belmont street	133 13
3011	1	Deansboro place	Deansboro avenue	North Main street	98 00
3012	1	Lake Park avenue	Warfield street	Thirtieth street	133 13
3013	1	Lake place	Center street	Hyman street	133 13
3014	1	Cleveland Park ave.	Twenty sixth street	Warfield street	200 00
3015	1	Hyman place	Pauline street	West street	133 13
3016	1	Hyman street	North Clark street	North LaSalle street	30 40
3017	1	Hyman street	North Clark street	Pine street	130 00
3018	1	Hyman street	North Clark street	North LaSalle street	30 40
3019	1	Hyman street	North Clark street	North LaSalle street	30 40
3020	1	Hyman street	North Clark street	Pine street	130 00
3021	1	Hyman street	North Clark street	Pine street	130 00
3022	1	Hyman street	North Clark street	Pine street	130 00
3023	1	Hyman street	North Clark street	Pine street	130 00
3024	1	Hyman street	North Clark street	Pine street	130 00
3025	1	Hyman street	North Clark street	Pine street	130 00
3026	1	Hyman street	North Clark street	Pine street	130 00
3027	1	Hyman street	North Clark street	Pine street	130 00
3028	1	Hyman street	North Clark street	Pine street	130 00
3029	1	Hyman street	North Clark street	Pine street	130 00
3030	1	Hyman street	North Clark street	Pine street	130 00
3031	1	Hyman street	North Clark street	Pine street	130 00
3032	1	Hyman street	North Clark street	Pine street	130 00
3033	1	Hyman street	North Clark street	Pine street	130 00
3034	1	Hyman street	North Clark street	Pine street	130 00
3035	1	Hyman street	North Clark street	Pine street	130 00
3036	1	Hyman street	North Clark street	Pine street	130 00
3037	1	Hyman street	North Clark street	Pine street	130 00
3038	1	Hyman street	North Clark street	Pine street	130 00
3039	1	Hyman street	North Clark street	Pine street	130 00
3040	1	Hyman street	North Clark street	Pine street	130 00
3041	1	Hyman street	North Clark street	Pine street	130 00
3042	1	Hyman street	North Clark street	Pine street	130 00
3043	1	Hyman street	North Clark street	Pine street	130 00
3044	1	Hyman street	North Clark street	Pine street	130 00
3045	1	Hyman street	North Clark street	Pine street	130 00
3046	1	Hyman street	North Clark street	Pine street	130 00
3047	1	Hyman street	North Clark street	Pine street	130 00
3048	1	Hyman street	North Clark street	Pine street	130 00
3049	1	Hyman street	North Clark street	Pine street	130 00
3050	1	Hyman street	North Clark street	Pine street	130 00
3051	1	Hyman street	North Clark street	Pine street	130 00
3052	1	Hyman street	North Clark street	Pine street	130 00
3053	1	Hyman street	North Clark street	Pine street	130 00
3054	1	Hyman street	North Clark street	Pine street	130 00
3055	1	Hyman street	North Clark street	Pine street	130 00
3056	1	Hyman street	North Clark street	Pine street	130 00
3057	1	Hyman street	North Clark street	Pine street	130 00
3058	1	Hyman street	North Clark street	Pine street	130 00
3059	1	Hyman street	North Clark street	Pine street	130 00
3060	1	Hyman street	North Clark street	Pine street	130 00
3061	1	Hyman street	North Clark street	Pine street	130 00
3062	1	Hyman street	North Clark street	Pine street	130 00
3063	1	Hyman street	North Clark street	Pine street	130 00
3064	1	Hyman street	North Clark street	Pine street	130 00
3065	1	Hyman street	North Clark street	Pine street	130 00
3066	1	Hyman street	North Clark street	Pine street	130 00
3067	1	Hyman street	North Clark street	Pine street	130 00
3068	1	Hyman street	North Clark street	Pine street	130 00
3069	1	Hyman street	North Clark street	Pine street	130 00
3070	1	Hyman street	North Clark street	Pine street	130 00
3071	1	Hyman street	North Clark street	Pine street	130 00
3072	1	Hyman street	North Clark street	Pine street	130 00
3073	1	Hyman street	North Clark street	Pine street	130 00
3074	1	Hyman street	North Clark street	Pine street	130 00
3075	1	Hyman street	North Clark street	Pine street	130 00
3076	1	Hyman street	North Clark street	Pine street	130 00
3077	1	Hyman street	North Clark street	Pine street	130 00
3078	1	Hyman street	North Clark street	Pine street	130 00
3079	1	Hyman street	North Clark street	Pine street	130 00
3080	1	Hyman street	North Clark street	Pine street	130 00
3081	1	Hyman street	North Clark street	Pine street	130 00
3082	1	Hyman street	North Clark street	Pine street	130 00
3083	1	Hyman street	North Clark street	Pine street	130 00
3084	1	Hyman street	North Clark street	Pine street	130 00
3085	1	Hyman street	North Clark street	Pine street	130 00
3086	1	Hyman street	North Clark street	Pine street	130 00
3087	1	Hyman street	North Clark street	Pine street	130 00
3088	1	Hyman street	North Clark street	Pine street	130 00
3089	1	Hyman street	North Clark street	Pine street	130 00
3090	1	Hyman street	North Clark street	Pine street	130 00
3091	1	Hyman street	North Clark street	Pine street	130 00
3092	1	Hyman street	North Clark street	Pine street	130 00
3093	1	Hyman street	North Clark street	Pine street	130 00
3094	1	Hyman street	North Clark street	Pine street	130 00
3095	1	Hyman street	North Clark street	Pine street	130 00
3096	1	Hyman street	North Clark street	Pine street	130 00
3097	1	Hyman street	North Clark street	Pine street	130 00
3098	1	Hyman street	North Clark street	Pine street	130 00
3099	1	Hyman street	North Clark street	Pine street	130 00
3100	1	Hyman street	North Clark street	Pine street	130 00

\$2,500 00

STATEMENT OF ASSESSMENTS FOR THE ERECTION OF OIL
LAMP POSTS.

No. of posts.	No. of posts.	NAME OF STREET.	FROM	TO	AMOUNT.
3041	10	Henry street	Loomis street	Ashland avenue	\$ 311 50
3042	10	Henry street	Center avenue	East terminus	404 35
3043	9	Brown street	West Fourteenth st.	C. B. & Q. R.R. tracks	280 35
3044	4	Law avenue	West Harrison street	North terminus	124 00
3045	6	Lytle street	Gilpin place	West Taylor street	180 00
3046	44	Clybourne avenue	Racine avenue	Fullerton avenue	1,282 00
					\$2,500 00

SUMMARY.

Total assessments for wooden block
pavement, including curbing
and filling:

North Division	\$ 87,968 96	
South Division.....	454,013 58	
West Division.....	167,213 78	
		\$ 709,196 32

Total assessments for miscellane-
ous street and alley improve-
ments:

North Division	\$ 3,463 80	
South Division.....	151,227 79	
West Division.....	181,480 41	
		336,172 00

Total assessments for laying pri-
vate drains:

North Division.....	2,644 00	
South Division.....	27,266 40	
West Division.....	16,612 50	
		46,522 90

Total assessments for laying water
service pipes:

North Division.....	4,685 05	
South Division.....	29,763 30	
West Division.....	20,103 10	
		54,551 45

Total assessments for street and
alley openings and widenings:

North Division.....	8,459 96	
South Division.....	15,058 77	
West Division.....	19,159 21	
		42,677 94

Total assessments for constructing
plank sidewalks:

North Division.....	427 98	
South Division.....	12,907 76	
West Division.....	17,255 37	
		30,591 11

Total assessments for the erection
of gas lamp posts:

North Division.....	2,192 74	
South Division.....	560 70	
West Division.....	2,113 65	
		4,867 09

Total assessments for the erection
of oil lamp posts:

North Division.....	1,282 60	
West Division.....	1,308 30	
		2,590 90
		1,227,169 71

Total number of gas lamp posts
erected by assessment:

NORTH DIVISION.

From January 1, 1881, to January 1, 1882.....	70	
Erected prior to January 1, 1881.	2,262	
		2,332

SOUTH DIVISION.

From January 1, 1881, to January 1, 1882.....	18	
Erected prior to January 1, 1881.	3,140	
		3,158

WEST DIVISION.

From January 1, 1881, to January 1, 1882.....	71	
Erected prior to January 1, 1881.	5,584	
		5,655
Total number erected by assessment.....		11,145
In addition to the above there are bridge and viaduct posts, not provided for by assessment, making the total number of lamp posts in the city lighted with gas.....		11,344
Total number of oil lamp posts erected by special assessment:		

NORTH DIVISION.

From January 1, 1881, to January 1, 1882.....	44
---	----

WEST DIVISION.

From January 1, 1881, to January 1, 1882.....	42	
		86

The street improvements made during the past year, in addition to those previously reported, gives the following

RECAPITULATION.

658,434 lineal feet of wooden block pavement,	
equal to.....	124 ⁸⁷⁷ / ₈₈₀ miles.
8,958 lineal feet of stone pavement, equal to..	1 ⁸⁷⁷ / ₈₈₀ "
48,849 lineal feet of cindering, equal to.....	9 ⁸⁷⁷ / ₈₈₀ "

39,056 lineal feet of graveling, equal to.....	$7\frac{2096}{5280}$	miles.
75,311 lineal feet of Macadamizing, equal to	$14\frac{391}{5280}$	"
390 lineal feet of asphaltic block pavement, equal to.....	$\frac{390}{5280}$	"
Total number of miles improved in the city	$157\frac{2096}{5280}$	

These improvements are distributed in the three divisions of the city as follows:

NORTH DIVISION.

154,488 lineal feet of wooden block pavement, equal to.....	$29\frac{368}{5280}$	miles.
3,049 lineal feet of Macadamizing, equal to..	$\frac{3049}{5280}$	"
908 lineal feet of stone pavement, equal to...	$\frac{608}{5280}$	"
1,194 lineal feet of graveling, equal to.....	$\frac{1194}{5280}$	"
6,666 lineal feet of cindering, equal to	$1\frac{386}{5280}$	"
Total number of miles.....	$31\frac{2625}{5280}$	

SOUTH DIVISION.

235,129 lineal feet of wooden block pavement, equal to.....	$44\frac{809}{5280}$	miles.
12,746 lineal feet of Macadamizing, equal to..	$2\frac{186}{5280}$	"
8,050 lineal feet stone pavement, equal to.....	$1\frac{770}{5280}$	"
23,942 lineal feet graveling equal to.....	$4\frac{822}{5280}$	"
390 lineal feet of asphaltic block pavement, equal to.....	$\frac{390}{5280}$	"
Total number of miles.....	$53\frac{417}{5280}$	

WEST DIVISION.

268,817 lineal feet wooden block pavement, equal to.....	$50\frac{817}{5280}$	miles.
59,516 lineal feet Macadamizing, equal to....	$11\frac{1436}{5280}$	"
13,920 lineal feet graveling, equal to.....	$2\frac{360}{5280}$	"
42,183 lineal feet cindering, equal to.....	$7\frac{523}{5280}$	"
Total number of miles.....	$72\frac{276}{5280}$	

The following list shows the total of assessments made in each year since 1861.

For the year ending April 1, 1862.....	\$ 42,635 49
For the year ending April 1, 1863.....	46,493 67
For the year ending April 1, 1864.....	389,169 31
For the year ending April 1, 1865.....	103,576 35
For the year ending April 1, 1866.....	802,574 56
For the year ending April 1, 1867.....	317,206 18
For the year ending April 1, 1868.....	1,354,436 48
For the year ending April 1, 1869.....	2,395,683 03
For the year ending April 1, 1870.....	2,836,852 48
For the year ending April 1, 1871.....	2,359,835 89
For the year ending April 1, 1872.....	62,222 25
For the year ending April 1, 1873.....	
For the year ending April 1, 1874.....	749,460 27
For the year ending April 1, 1875	723,254 42
For the nine months ending January 1, 1876..	60,585 72
For the year ending January 1, 1877.....	1,516,081 07
For the year ending January 1, 1878.....	124,498 48
For the year ending January 1, 1879.....	284,900 45
For the year ending January 1, 1880.....	588,963 43
For the year ending January 1, 1881.....	980,895 50
For the year ending January 1, 1882.....	1,227,169 71

Total for twenty-one years.....\$16,966,494 74

Respectfully submitted,

H. J. JONES,

Superintendent of Special Assessments.

MAP DEPARTMENT.

CHICAGO, April 1st, 1882.

HON. CARTER H. HARRISON, MAYOR,

In charge of Department of Public Works:

I herewith submit the annual report of the Map Department for the year ending December 31st, 1881.

The number of new subdivisions of lands inside the city limits for the last year has been 102—all of which have been entered upon the different sets of atlases of this office.

These subdivisions add 6.46 miles of streets and 6 miles of alleys to the number of miles of streets and alleys of this city.

The following ordinances, referring to opening, widening or vacating of streets or alleys have been passed by the City Council last year and noted in the different atlases.

OPENINGS, WIDENINGS AND EXTENSIONS.

Opening of alley in west $\frac{1}{2}$ Blocks 79, 84, 85 and 90 of west $\frac{1}{2}$ of Sec. 27, 39, 14—Ord. p. Jan. 3.

Widening of W. Jackson street from Kedzie avenue to Homan avenue. Jan. 24.

Opening of alley in north $\frac{1}{2}$ Block 56, Sec. 7, 39, 14. Jan. 31.

Opening of alley from W. Madison street to W. Lake street, in D. McIntosh's subdivision of part of south $\frac{1}{2}$ southeast $\frac{1}{4}$ Sec. 12, 39, 13. Feb. 7.

Widening of Thirty-third street from Forest avenue to South Park avenue. March 11.

Widening Forest avenue through Shoneham's subdivision of Lot 1, Block 2 Dyer & Davison's subdivision of southeast $\frac{1}{4}$ northwest $\frac{1}{4}$ Sec. 34, 39, 14. March 11.

Extending Maple street from its eastern terminus to N. State street. March 11.

Opening Twenty-ninth street from Stewart avenue to Shields avenue. March 11.

Opening Ward court from eastern terminus to Lumber street. March 11.

Opening of alley from south line of Block 82 in west $\frac{1}{2}$ of Sec. 27, 39, 14 to Twenty-eighth street. March 28.

Widening Jefferson street (to 66 ft.) from Harrison street to W. Twelfth street. March 28.

Opening Talman avenue from southern terminus to W. Lake street. March 28.

Opening and widening Fairfield avenue from W. Twelfth street to Ogden avenue. March 28.

Opening Union street from W. Madison to W. Twelfth street. March 28.

Opening of Oak street east to N. State street through Block 10, C. P. subdivision of south fraction $\frac{1}{4}$ Sec. 3, 39, 14. June 6.

Widening of California avenue from south line of Davis' Add. to W. Lake street. June 20.

Widening of Sherman street and Pacific avenue between Jackson and Van Buren streets. June 27.

Opening of La Salle street through Block 15 of Sec. 33, 39, 14. June 27.

Opening of Sanger street from Archer avenue to south branch of river. Oct. 3.

Opening of Bonney avenue in Blocks 3 and 6 of Chas. C. Morey's subdivision of east $\frac{1}{2}$ northwest $\frac{1}{4}$ Sec. 26, 39, 13. Oct. 3.

Widening of Thirty-eighth street from State street to Wabash avenue. Oct. 3.

Opening of alley in Block 2 of Davis Add. Oct. 17.

Opening of Union street from Lumber street to south branch of Chicago river. Nov. 14.

Widening of Jefferson street (to 60 ft.) from W. Harrison street to W. Twelfth street. Nov. 14.

Widening the south branch of Chicago river between Adams street and Van Buren street. Dec. 5.

Widening north branch of river in Lot 1 Block 80 Russell, Mather & Roberts Add. Dec. 12.

These ordinances will eventually increase the number of miles of streets by 1.56 miles and the number of miles of alleys by 0.43 miles—and add 28,050 square feet to the area of the Chicago River.

REPEALING ORDINANCES.

Widening Ellen street from Wood street to Lincoln street. (Ordinance passed Oct. 11, 1880.) Repealed Jan. 17.

Opening of alley in north $\frac{1}{2}$ Block 56, Sec. 7, 39, 14. (Ordinance passed Jan. 5, 1875.) Repealed Jan. 24.

Widening Thirty-third street from Forest avenue to S. Park avenue. (Ordinance passed March 1, 1881.) Repealed March 7.

Widening Thirty-seventh street from west line of lot 8, Brown's subdivision of north $\frac{1}{2}$, southwest $\frac{1}{4}$, southwest $\frac{1}{4}$ of Sec. 34, 39, 14 to Grand Boulevard. (Ordinance passed Jan. 12, 1880.) Repealed Sept. 20.

Widening Jefferson street (to 66 ft.) from W. Harrison street to W. Twelfth street. (Ordinance passed March 28, 1881.) Repealed Nov. 14.

Straightening alley in south $\frac{1}{2}$ Block 59 of Sec. 7, 39, 14. (Ordinance passed March 24, 1880.) Proceedings ordered stopped Nov. 7.

VACATIONS.

Vacation of that part of Sebor and Mather street lying between Canal and Beach streets. March 28.

Vacation of alley in Block 16 of subdivision of south $\frac{3}{4}$ Sec. 20, 39, 14. April 11.

Vacation of La Salle street between Jackson and Van Buren streets. June 27.

Vacation of alley in Block 4 of S. F. Smith's subdivision of northeast $\frac{1}{4}$ northeast $\frac{1}{4}$ Sec. 18, 39, 14. Oct. 17.

Vacation of alley in Block 3 of Owsley's subdivision in Sec. 18, 39, 14. Oct. 10.

CHANGING STREET NAMES.

Smith street (in S. F. Smith's subdivision in Sec. 18, 39, 14) changed to Ogden place. March 14.

Hubbs street changed to Parnell avenue. March 23.

Foster street changed to Law avenue. March 28.

North La Salle street changed to La Salle avenue. March 28.

Sophia street changed to Garfield avenue. Sept. 29.

Alley running northwesterly between Blackhawk street and Rees street, and southwesterly of Clybourn avenue named Uhland street. Sept. 29.

HOUSE NUMBERS.

As stated in my last annual report the houses on a great many streets are wrongly numbered. The following is a list of such streets where this is particularly the case—as a comparison of the official house number maps with the division books of the water-office (where the house numbers are marked as they appear on the houses) will show. This is a great inconvenience to the public and an immediate correction of this evil seems most expedient. The attention of property owners on such streets is respectfully called to this with the request to obtain at this office their correct house numbers free of charge.

NORTH DIVISION.

North Branch street, from Halsted to Bliss street.

Division street, east of State street.

Elm street for its entire length.

Erie street east of St. Clair street.

Franklin street, from North avenue to Menominee street.

Hernon street, from Garfield avenue to city limits.

Hobbie street, from Hawthorne avenue to Larrabee street.

Hurbut street, from Blackhawk street to city limits.

Illinois street, east of St. Clair street.

Kroger street, from Clyde street to Racine avenue.

Market street, from Schiller street to North avenue.

NORTHWEST DIVISION.

Ada street, from Randolph street to Kinzie street.

Armour street, between Indiana street and Ohio street.

Bickerdike street, from Indiana street to Chicago avenue.
Blackhawk street, from Noble street to Paulina street.
Brigham street, from Ashland avenue to Wood street.
Cleaver street, from Milwaukee avenue to Bradley street.
Commercial street, from North avenue to Armitage avenue.
Edgar street, from North avenue to Clybourn avenue.
Elizabeth street, from Randolph to Kinzie street.
Elk Grove street, from Lincoln street to North avenue.
Halsted street, from Fulton street to Walnut street.
Holt street, from Division street to Wabansia avenue.
Julian street, from Ashland avenue to Wood street.
Keenan street, from Ashland avenue to Wood street.
Leavitt street, from Hubbard street to Indiana street.
Le Moyne street, from Roby to Leavitt street.
Lincoln street, from W. Lake to Kinzie street.
Marion street, from Division street to Ellen street.
McHenry street for its entire length.
McReynolds street, from Ashland avenue to Wood street.
Newton street, from Iowa street to Thomas street.
Oakley avenue, from Hubbard street to Indiana street.
Sangamon street, from Chicago avenue to Dix street.
Sheldon street, from Randolph street to Kinzie street.
Wood street, from W. Lake to Kinzie street.

WEST AND SOUTHWEST DIVISION.

Almond street, from W. Taylor street to Ashland avenue.

Carpenter street, from W. Lake to W. Madison street.

Honore street, from Madison to Harrison street.

Hoyne avenue, from Randolph street to Harrison street.

Irving avenue, from its northern terminus to W. Jackson street.

Leavitt street, from W. Madison street to W. Jackson street.

Lytle street, between Taylor street and Gilpin place.

Page street, from Lake to Madison street.

Paulina street, from Lake street south.

W. Eighteenth place, from Johnson street to Brown street.

SOUTH DIVISION.

Bryant place, from Cottage Grove avenue to Haunton street.

Egan avenue, from Lake avenue to Langley avenue.

Elgin street for its entire length.

Fuller street for its entire length.

Oak avenue, from Cottage Grove avenue to Haunton avenue.

Sheridan street for its entire length.

Sixteenth street for its entire length.

Eighteenth street, from State street to Wentworth avenue.

Twenty-third street for its entire length.

Twenty-fifth street, from Lake Park avenue to South Park avenue.

Thirty-first street, from Lake Park avenue to South Park avenue.

Thirty-third street, from Lake Park avenue to Cottage Grove avenue.

After May 1 this department will have finished the street number maps for most of such streets as have not heretofore been provided with numbers, when the property owners can obtain their correct numbers by applying at this office. To insure correctness the description should always be given.

The following number of plats, tracings, etc., for ordinances and for the use of the different departments have been prepared during the last year by the Map Department.

For Special Assessment Dept:

164 plats for sidewalk ass'm't.

127 plats for street improvement ass'm't.

87 plats for lamp post ordinances.

75 plats for ordinances for opening or extension of streets, etc.

5 plats for vacation of streets and alleys.

For Street Department:

11 survey maps.

122 tracings for location of lamp posts.

For Law Department:

4 plats.

For Miscellaneous Purposes:

11 plats and tracings.

The clerks of the Superior and Circuit Courts of this county

have always neglected to have plats of divisions made, by order of said courts recorded as they are expected to do (see Revised Statutes of Illinois 1877—p. 732). The Recorder of this county ought to be requested to cause such plats to be recorded. The same request applies to the Department of Public Works in reference to the opening or vacating of streets or alleys (see Revised Statutes 1877—page 732).

Respectfully,

FRANCIS A. DEMMLER,

Supt. of Maps.

SEWERAGE DEPARTMENT.

CHICAGO, 3d January, 1882.

THE HON. CARTER H. HARRISON,

Mayor, Etc.

MY DEAR SIR:—With feelings of profound gratitude for the many acts of friendship and kindness which you have extended to me—officially and personally—during the year just closed, it is with peculiar satisfaction that I am enabled to address to your honor this, my second annual report on the condition and operations of the General Sewerage and Drainage Department of the City of Chicago, for the year ending the 31st day of December, 1881; and for a full description of the extent of the system and some of its structural characteristics, your attention is invited to the following tabular statements, viz:

LENGTHS AND INTERIOR DIAMETERS OF MAIN, SUB-MAIN AND LATERAL SEWERS, COMPOSING THE
PRIMARY DRAINAGE SYSTEM OF THE CITY OF CHICAGO, AS IT EXISTED ON THE 31ST DAY OF
DECEMBER, 1881.—"A."

WARDS.	9 Feet.	8 Feet.	6½ Feet.	6 Feet.	5½ Feet.	5 Feet.	4½ Feet.	4 Feet.	3½ Feet.	3 Feet.	2½ Feet.	2 Feet.	30 Inch.	18 Inch.	15 Inch.	12 Inch.	Total Lin. ft.
First.....								1936	.....	8470	13660	4986	13135	.....	1870	40862	80509
Second.....						494	.....	.....	.....	5260	6905	2073	11096	.....	.....	28074	54802
Third.....				1180	.....	4008	.....	656	.....	1485	16905	.....	.....	.....	619	26085	73232
Fourth.....				704	.....	1088	1261	1745	916	4085	30547	.....	49247	.....	5853	5914	143190
Fifth.....				1024	.....	.....	.....	7000	3285	15547	11348	.....	31482	.....	7868	11369	173895
Sixth.....					4114	5910	12105	10355	5498	5193	3855	.....	29705	.....	13650	39472	132702
Seventh.....	5550	2250	1380	1972	.....	5845	1919	10443	5923	6675	3230	.....	29705	.....	.....	.....	134204
Eighth.....						3976	10675	6320	.....	1175	630	.....	37445	.....	14874	46671	101279
Ninth.....						9027	4198	.....	.....	.....	.....	.....	84475	.....	.....	35739	96772
Tenth.....				1246	.....	6648	3911	.....	.....	.....	.....	.....	88810	.....	.....	.....	63198
Eleventh.....							19019	3984	.....	706	590	.....	31482	.....	.....	35082	93184
Twelfth.....								16680	12133	11706	8990	.....	4747	.....	.....	35082	154179
Thirteenth.....								116504	5189	4623	2560	.....	10998	.....	3985	5389	51083
Fourteenth.....								8308	516	3230	431	.....	54135	.....	1458	40606	90413
Fifteenth.....								5510	3739	3308	16670	.....	37103	.....	3183	61057	184823
Sixteenth.....								660	.....	2354	9029	.....	24118	.....	9607	53977	132493
Seventeenth.....								352	.....	1962	3760	.....	22758	.....	.....	338	71358
Eighteenth.....								5496	.....	3867	580	.....	41957	.....	.....	846	64653
Totals in feet.....	5350	2250	1380	13546	5400	72887	70372	92136	36188	89536	151405	6359	553982	1625	25156	97266	710013

And hence $1\frac{1}{2}\frac{3}{4}\frac{5}{8}\frac{7}{16}\frac{9}{32} = 365.266$ miles, of which 204.3 miles are constructed of brick, and 157.966 miles of vitrified pipe.

In connection with the foregoing table "A," the following exhibit "B" shows the lengths and interior diameters of house drains composing the secondary drainage system of the City of Chicago, the linear measurements made from their junctions with the primary system in the centres of the streets, to the regulation point, four feet within the curb lines, as the same existed on the 31st day of December, 1881.—"B."

6-inch pipe.....	1,956,702 linear feet.
9 " "	77,497 " "
12 " "	9,209 " "
15 " "	242 " "
18 " "	38 " "
24 " brick.....	116 " "

Total.....2,043,804 linear feet.

And hence $\frac{2,043,804}{5280} = 387.08$ miles. This is equal to 4.06 feet per capita.

The primary drainage system, whose extent is set forth in detail in table "A," and which contains 1,912,765 linear feet, or 362.266 miles, is divided into eighty-six sub-systems, as exhibited in the following tables, which show their distribution in the three divisions of the city, the streets or avenues in which their outfalls are located, and likewise the internal diameters of the several main sewers at their outfall portals:

CHICAGO MAIN DRAINAGE—PRIMARY SYSTEM.

SUB-SYSTEMS IN THE NORTH DIVISION.—"C."

No.	STREETS.	Diameter in Outfall.	No.	STREETS.	Diameter in Outfall.
1	Rush street.....	5 feet.	8	Erie street.....	3 feet.
2	State street.....	2 "	9	Chicago avenue....	4 "
3	Dearborn street....	2 "	10	Halsted street.....	3 "
4	Clark street.....	6 "	11	Division street....	3 "
5	LaSalle street.....	1½—1½ ft.	12	North avenue.....	4½ "
6	Wells street.....	2 feet.	13	Clybourne avenue..	4 "
7	Franklin street....	6 "	14	Webster avenue....	4 "

The total length of sewers included in the primary system in the North Division, as represented by the foregoing fourteen sub-systems, is 370,121 linear feet, or 70.098 miles, and is equal to 19.35 per cent. of the entire primary system of the city.

SUB-SYSTEMS IN THE SOUTH DIVISION.—"D."

No.	STREETS.	Diameter at Outfall.	No.	STREETS.	Diameter at Outfall.
1	Michigan avenue...	4 feet.	21	Fourteenth street...	2½ feet
2	Wabash avenue.....	2 "	22	Fifteenth street.....	2 "
3	State street.....	2½ "	23	Sixteenth street.....	3 "
4	Dearborn street.....	2 "	24	Eighteenth street.....	3 "
5	Clark street.....	2 "	25	Nineteenth street.....	3 "
6	La Salle street.....	1½ & 1½ ft.	26	Stewart avenue.....	3 "
7	Fifth avenue.....	2 feet.	27	Twenty-second street	3 "
8	Franklin street.....	2 "	28	Wallace street.....	6 "
9	Lake street.....	1 "	29	Halsted street.....	5 "
10	Randolph street.....	2 & 3 "	30	Quarry street.....	3 "
11	Washington street.....	3 "	31	Main street.....	3 "
12	Madison street.....	3 "	32	Deering street.....	3 "
13	Monroe street.....	3 "	33	Archer avenue, west.	3 "
14	Adams street.....	3 "	34	Archer avenue, east.	3 "
15	Jackson street.....	3 "	35	Thirty-first street...	5 "
16	Van Buren street.....	3 "	36	Douglas avenue.....	4½ "
17	Harrison street.....	3 "	37	* Twelfth street.....	5 "
18	Polk street.....	2½ "	38	* Twenty-second st...	6 "
19	Taylor street.....	3 "	39	* Douglas avenue....	6 "
20	Twelfth street.....	2½ "			

* In the Lake.

The total length of sewers included in the primary system in the South Division, as represented by the foregoing thirty-nine sub-systems, is 535,428 linear feet or 101.407 miles, and is equal to 27.99 per cent. of the entire primary system of the city.

SUB-SYSTEMS IN THE WEST DIVISION.—"E."

No.	STREETS.	Diameter at Outfall.	No.	STREETS.	Diameter at Outfall.
1	Clybourn Place.....	2 feet.	18	Van Buren street.....	5 feet.
2	North avenue.....	6 "	19	Harrison street.....	5 "
3	Black Hawk street..	5 "	20	Polk street.....	4 "
4	Division street.....	5 "	21	Taylor street.....	5 "
5	Augusta street.....	5 "	22	Twelfth street.....	5 "
6	Chicago avenue.....	3 "	23	Maxwell street.....	5 "
7	Erie street.....	3 "	24	Fourteenth street....	4 "
8	Kinzie street.....	6 "	25	Sixteenth street.....	4 "
9	Carroll avenue.....	2 "	26	Eighteenth street....	4 "
10	Fulton street.....	4 "	27	Twenty-second street	2½ "
11	Lake street.....	2 "	28	Halstead street.....	4 "
12	Randolph street.....	5 "	29	Morgan street.....	4½ "
13	Washington street..	2 "	30	Centre avenue.....	4½ "
14	Madison street.....	5 "	31	Ashland avenue.....	5½ "
15	Monroe street.....	2 "	32	Leavitt street.....	6½ "
16	Adams street.....	5 "	33	Western avenue.....	5 "
17	Jackson street.....	2 "			

The total length of sewers included in the primary system in the West Division, as represented by the foregoing thirty-three sub-systems is 1,007,216 linear feet, or 190.761 miles, and is equal to 52.66 per cent. of the entire primary system of the city.

During the past year the primary system has been extended by the construction of 132,076 linear feet, or 25.014 miles, of new sewers, the location, the lengths, and the interior diameters of all of which are given in the following tabular exhibits, alphabetically arranged, by divisions, for convenient reference.

CHICAGO MAIN DRAINAGE.—PRIMARY SYSTEM.

SEWERS CONSTRUCTED DURING THE YEAR 1881 IN THE NORTH DIVISION.—"F."

IN	FROM.	TO.	Diam. feet.	Ln. feet.	Ma- terial
Bissell street.....	Clay street.....	Centre street.....	1	775	pipe
Belden place.....	Belden avenue.....	North and West.....	1	472	pipe
Cass Street.....	Chestnut street.....	North.....	1	262	pipe
Division street.....	Astor street.....	Lake shore drive.....	1½	440	pipe
Edwards street.....	Sophia street.....	Webster avenue.....	1	655	pipe
Eugenie street.....	Wells street.....	East.....	1	178	pipe
Franklin street.....	Eugenie street.....	Starr street.....	1	274	pipe
Herndon street.....	Webster avenue.....	Clybourn avenue.....	1½	895	pipe
Huron street.....	Kingsbury street.....	West.....	1	330	pipe
Jay street.....	Webster avenue.....	South.....	1	323	pipe
Lewis street.....	Webster avenue.....	Sophia street.....	1	670	pipe
Lincoln avenue.....	Belden avenue.....	Fullerton avenue.....	1½	804	pipe
La Salle street.....	North avenue.....	Clark street.....	1	845	pipe
Lane place.....	Sophia street.....	Center street.....	1	662	pipe
Pearl street.....	Sophia street.....	Webster avenue.....	1	665	pipe
Racine avenue.....	Webster avenue.....	Belden avenue.....	2	703	brick
Racine avenue.....	Belden avenue.....	Fullerton avenue.....	1½	615	pipe
Superior street.....	Kingsbury street.....	West.....	1	330	pipe
State street.....	Schiller street.....	Burton place.....	2½	630	brick
State street.....	Burton place.....	North avenue.....	2	616	brick

The total length of new sewers constructed in the North Division, as shown by the foregoing table, being 11,124 linear feet, or 2.107 miles—it is equal to 8.42 per cent. of the entire construction during the year just closed.

SEWERS CONSTRUCTED DURING THE YEAR 1881 IN THE
SOUTH DIVISION.—"G."

IN.	FROM.	TO.	Diam. feet.	Ln'th feet.	Ma- terial.
Auburn street.....	Thirty-third street.....	Thirty-fourth street.....	1½	713	pipe
Dearborn street.....	Thirty-second street.....	Twenty-fifth street.....	1	1,992	pipe
Douglas avenue.....	Wallace street.....	Stewart avenue.....	3½	1,327	brick
Douglas avenue.....	Stewart avenue.....	La Salle street.....	3	1,652	brick
Egan avenue.....	Langley avenue.....	East 405 feet.....	1½	405	pipe
Egan avenue.....	Cottage Grove avenue.....	West 405 feet.....	1	404	pipe
Franklin street.....	Monroe street.....	North 210 feet.....	1	210	pipe
Gano street.....	90 feet E. of Prairie ave.....	300 ft. E. of Calumet av.....	1	488	pipe
Groveland park avenue.....	Twenty-ninth street.....	Thirtieth street.....	1	825	pipe
Hickory street.....	Main street.....	Quarry street.....	1½	1,180	pipe
Iglehart street.....	Twenty-seventh street.....	North and South.....	1	559	pipe
Lake park avenue.....	Thirty-third street.....	Thirty-second street.....	1½	747	pipe
La Salle street.....	Douglas avenue.....	Thirty-sixth street.....	2½	699	brick
La Salle street.....	Thirty-sixth street.....	Thirty-seventh street.....	2	661	brick
La Salle street.....	Thirty-seventh street.....	Thirty-eighth street.....	1½	630	pipe
La Salle street.....	Thirty-eighth street.....	South 18 feet.....	1½	18	pipe
La Salle street.....	Twenty-fourth street.....	Twenty-fifth street.....	1	666	pipe
Laurel street.....	Douglas avenue.....	Thirty-fourth street.....	2	783	brick
Laurel street.....	Thirty-fourth street.....	Thirty-third street.....	1½	709	pipe
Lyman street.....	Thirty-first street.....	Arch street.....	1½	665	pipe
Michigan avenue.....	Douglas avenue.....	Thirty-seventh street.....	2½	1,362	brick
Michigan avenue.....	Thirty-seventh street.....	Egan avenue.....	2	1,284	brick
Napoleon place.....	Wallace street.....	Hanover street.....	1	888	pipe
Rhodes avenue.....	Thirty-third street.....	Thirty-second street.....	2	713	brick
Shields avenue.....	400 feet N. of 31st street.....	Thirtieth street.....	1½	133	pipe
Shields avenue.....	Thirtieth street.....	Swift place.....	1½	529	pipe
Shields avenue.....	Swift place.....	Napoleon place.....	1	500	pipe
Spring street.....	State street.....	West 52 feet.....	1	52	pipe
Swift place.....	Shields avenue.....	Wentworth avenue.....	1	998	pipe
Twenty-first street.....	Alley E. of Prairie ave.....	Calumet avenue.....	1	217	pipe
Twenty-fifth street.....	Wallace street.....	Stewart avenue.....	1	1,210	pipe
Twenty-seventh street.....	Halsted street.....	Lime street.....	1½	292	pipe
Twenty-seventh street.....	Wallace street.....	Stewart avenue.....	1	1,367	pipe
Twenty-eighth street.....	Wallace street.....	Hanover street.....	1	888	pipe
Thirtieth street.....	Shields avenue.....	Wentworth avenue.....	1	998	pipe
Thirty-third street.....	Vernon avenue.....	East 208 feet.....	1	208	pipe
Thirty-eighth street.....	Forest avenue.....	Calumet avenue.....	1½	365	pipe
Thirty-eighth street.....	Clark street.....	La Salle street.....	1	243	pipe
Vernon avenue.....	Thirty-third street.....	Thirty-second street.....	1½	687	pipe
Vernon avenue.....	Thirty-second street.....	North.....	1½	427	pipe
Wallace street.....	Archer avenue.....	Kossuth street.....	6	1,034	brick

The total length of new sewers constructed in the South Division, as shown by the foregoing table, being 29,628 linear feet, or 5.611 miles. It is equal to 22.43 per cent. of the entire construction during the past year.

SEWERS CONSTRUCTED DURING THE YEAR 1881 IN THE
WEST DIVISION.—"H."

IN	FROM	TO	Diam Feet.	Length in Feet.	Material
Alley W. of Jefferson st	Van Buren street	Adams street	1	794	pipe
Ambrose street	Leavitt street	East	1	490	pipe
Artesian avenue	Ohio street	Grand avenue	1 1/4	500	pipe
Artesian avenue	Hubbard street	Grand avenue	1	440	pipe
Arthington street	Centre avenue	Lytle street	1	420	pipe
Ashland avenue	Waubansia avenue	North	1	505	pipe
Blue Island avenue	Wood street	Ashland avenue	2	1,480	brick
Brown street	Nineteenth street	Twentieth street	1	508	pipe
Broom street	Indiana street	Ohio street	1	491	pipe
California avenue	W. Twenty-second st	W. Sixteenth street	4 1/2	2,655	brick
California avenue	W. Sixteenth street	W. Twelfth street	4	2,655	brick
California avenue	W. Twelfth street	W. Harrison street	3 1/2	2,653	brick
California avenue	W. Harrison street	W. Madison street	3	2,655	brick
California avenue	W. Madison street	W. Kinzie street	2 1/2	2,415	brick
Congress street	Robey street	Winchester avenue	1	340	pipe
Cicero court	Jackson street	South	1	40	pipe
Campbell avenue	Congress street	Harrison street	1	370	pipe
Chicago avenue	Hoyle avenue	Leavitt street	2 1/2	675	brick
Dickson street	North avenue	Waubansia avenue	1 3/4	680	pipe
Dickson street	Waubansia avenue	North	1	555	pipe
Eighteenth street	Ashland avenue	West	1	325	pipe
Elston avenue	Blanche street	North avenue	1 3/4	635	pipe
Ewing place	Robey street	Hoyle avenue	1	666	pipe
Fifteenth street	Wood street	Paulina street	1	638	pipe
Fourteenth street	Wood street	Paulina street	1	638	pipe
Flournoy street	Western avenue	Oakley avenue	1 1/2	705	pipe
Fowler street	Hoyle avenue	West	1	510	pipe
Henry street	Ashland avenue	Paulina street	1 3/4	717	pipe
Hastings street	Wood street	Paulina street	1	638	pipe
Hermitage avenue	Polk street	York street	1	438	pipe
Hoyle avenue	Madison street	Warren avenue	1	288	pipe
Hoyle avenue	Indiana street	Ohio street	2	528	brick
Hoyle avenue	Chicago avenue	Superior street	2	431	brick
Hoyle avenue	Ewing place	North avenue	1	360	pipe
Hubbard street	Oakley avenue	Western avenue	1 1/2	665	pipe
Johnson street	Sixteenth street	Eighteenth street	1	670	pipe
Jackson street	California avenue	Francisco street	1 1/4	644	pipe
Jackson street	Francisco street	Sacramento street	1 3/4	705	pipe
Loomis street	Harrison street	North	1	245	pipe
Lincoln street	Congress street	Harrison street	1 1/4	395	pipe
Lincoln street	Congress street	Van Buren street	1	405	pipe
Lincoln street	Lake street	Park avenue	1	270	pipe
Lincoln street	Carroll avenue	Kinzie street	1	264	pipe
Lincoln street	Walnut street	Fulton street	1	222	pipe
Leavitt street	Erie street	Ohio street	1 1/2	365	pipe
Leavitt street	Lake street	Walnut street	1	284	pipe
Leavitt street	Van Buren street	Harrison street	1	800	pipe
Lee place	Hoyle avenue	Leavitt street	1	668	pipe
Leasing street	Chicago avenue	Front street	2	395	brick
LeMoine street	Robey street	Hoyle avenue	1	666	pipe
Morgan street	Sixteenth street	Eighteenth street	1	680	pipe
May street	Twentieth street	Twenty-first street	1	510	pipe
Marshfield avenue	Twelfth street	Taylor street	1	875	pipe
McHenry street	Waubansia avenue	Redfield street	1 1/4	325	pipe
Nineteenth street	Throop street	Loomis street	1 3/4	640	pipe
Nineteenth street	Ladlin street	Ashland avenue	1 3/4	690	pipe
Nineteenth street	Paulina street	Ashland avenue	1	651	pipe
Nixon street	Polk street	South	1	315	pipe
North avenue	Wood street	Seymour street	1	4671	pipe
Noble street	Blackhawk street	North avenue	2	1324	brick
Ogden avenue	Harrison street	Southwest	1 1/4	785	pipe
Ogden avenue	Madison street	Washington street	1 1/4	536	pipe
Ogden avenue	Randolph street	Washington street	1	491	pipe
Oakley avenue	Monroe street	Jackson street	1	791	pipe
Oakley avenue	Flournoy street	Woodbine place	1 1/4	145	pipe
Ohio street	Paulina street	Wood street	1 3/4	666	pipe
Ohio street	Robey street	Leavitt street	1	1336	pipe
Ohio street	Diller street	Western avenue	1	334	pipe
Ohio street	Western avenue	Artesian avenue	1 1/4	328	pipe

SEWERS CONSTRUCTED DURING THE YEAR 1881 IN THE
WEST DIVISION.—"H."—CONTINUED.

IN	FROM	TO	Diam. Feet.	Length in feet.	Material.
Osborne street.....	Indiana street.....	Ohio street.....	1	491	pipe
Polk street.....	Wood street.....	Paulina street.....	2	700	brick
Polk street.....	Paulina street.....	Ashland avenue.....	1½	654	pipe
Polk street.....	Ashland avenue.....	E. of Nixon street.....	1½	430	pipe
Paulina street.....	York street.....	Polk street.....	1	438	pipe
Paulina street.....	Lake street.....	Park avenue.....	1	307	pipe
Paulina street.....	Walnut street.....	Fulton Street.....	1	216	pipe
Page street.....	Kinzie street.....	Hubbard street.....	1	350	pipe
Park street.....	Fowler street.....	Robey street.....	1	1000	pipe
Rebecca street.....	Ashland avenue.....	Paulina street.....	1½	717	pipe
Rebecca street.....	Wood street.....	Paulina street.....	1	634	pipe
Robey street.....	Evergreen street.....	Bryson street.....	1½	370	pipe
Redfield street.....	McHenry street.....	Elston Avenue.....	1½	727	pipe
School street.....	End of old work.....	West.....	1	240	pipe
Smith street.....	Paulina street.....	Ogden avenue.....	1	560	pipe
Superior street.....	Hoyle avenue.....	Robey street.....	1	667	pipe
Superior street.....	Wood street.....	West.....	1	333	pipe
Seward street.....	Lumber street.....	North.....	1	428	pipe
Seymour street.....	150 ft. N. of Division st.	Alley S. of North ave.....	1½	2338	pipe
Twenty-second st.....	1539 ft. W. of Leavitt st.	W. line Sacramento st.	9	3791	brick
Twenty-second st.....	W. line Sacramento st.	West.....	8	2250	brick
Twenty-first st.....	Center avenue.....	Throop street.....	2	700	brick
Twentieth st.....	Brown street.....	Johnson street.....	1	335	pipe
Thirteenth st.....	Wood street.....	Lincoln street.....	1½	700	pipe
Thirteenth place.....	Wood street.....	Paulina street.....	1	638	pipe
Thirteenth place.....	Wood street.....	Paulina street.....	1	638	pipe
Twelfth street.....	Wood street.....	Lincoln street.....	1½	700	pipe
Twelfth street.....	Ashland avenue.....	Paulina street.....	2	660	brick
Twelfth street.....	Wood street.....	Hermitage avenue.....	1½	370	pipe
Twelfth street.....	Wood street.....	Paulina street.....	1	270	pipe
Twelfth street.....	Wood street.....	Lincoln street.....	1½	700	pipe
Throop street.....	Twenty-second street.....	267 ft. S. of 18th st.....	1	1661	pipe
Throop street.....	Thirteenth place.....	Henry street.....	1	1295	pipe
Taylor street.....	Ashland avenue.....	Marshfield avenue.....	2	390	brick
Trustee street.....	Kinzie street.....	North.....	1	253	pipe
Union place.....	Twenty-second st.....	Union street.....	1	430	pipe
Van Horn street.....	Ashland avenue.....	Paulina street.....	1	658	pipe
Wood street.....	Eighteenth street.....	Thirteenth street.....	3½	2656	brick
Wood street.....	Thirteenth street.....	Taylor street.....	3	1528	brick
Wood street.....	Taylor street.....	Polk street.....	2½	816	brick
Wood street.....	Jackson street.....	Van Buren street.....	1	445	pipe
Wood street.....	Monroe street.....	Smith street.....	1	106	pipe
Wood street.....	Warren avenue.....	North.....	1	146	pipe
Wood street.....	Lake street.....	Park avenue.....	1	282	pipe
Wood street.....	Kinzie street.....	Hubbard street.....	1	354	pipe
Wood street.....	Division street.....	Augusta street.....	1½	1325	pipe
Wood street.....	Milwaukee ave.....	Ellen street.....	1½	382	pipe
Woodbine place.....	Oakley avenue.....	Leavitt street.....	1	670	pipe
Winchester ave.....	Congress street.....	Van Buren street.....	1½	466	pipe
Western avenue.....	Indiana street.....	Ohio street.....	2	564	brick
Waubansia ave.....	Ashland avenue.....	Holt street.....	1	622	pipe
York street.....	Paulina street.....	Hermitage avenue.....	1	335	pipe

The total length of new Sewers constructed in the West Division, as shown by the foregoing table, being 91,324 linear feet, or 17.296 miles; it is equal to 69.15 per cent. of the entire construction during the year just closed.

There remain to be constructed under contracts awarded during the past year, and still in force, 6,829 linear feet of brick and pipe Sewers, classified as follows, viz:

"I"

12 INCH PIPE.	15 INCH PIPE.	18 INCH PIPE.	2 FEET BRICK.	2½ FEET BRICK.	8 FEET BRICK.	TOTAL FEET.
413	710	667	1873	1406	1760	6829

And hence $\frac{6829}{5480} = 1.293$ miles; all of which will be finished and in use by May of the current year.

The following table shows the number of new receiving-basins and new man-holes constructed during the year just closed, as well as the total number in place and in use at this date:

"J"

DESCRIPTION.	Constructed During the Year 1881.				In place 31st Dec. 1880.	Total in place 31st Dec'r 1881.
	North Division	South Division	West Division	Total.		
Receiving Basins.....	53	320	175	548	10,062	10,610
Man Holes.....	71	222	624	917	11,953	12,870

The cost of the foregoing in general and in detail will be found in tables "O," "P," and "Q," which also show the total cost of maintenance, and of repairs, of the primary sewerage system for the year 1881.

During the year just closed, extensive additions have been made to the Secondary or house drainage system, the details of which are given in the following tabulated statement:

"K."

HOUSE DRAINS PUT IN PLACE DURING THE YEAR 1881.
MEASURED FROM THE JUNCTIONS WITH THE MAIN SEWERS IN THE CENTERS OF THE STREETS TO A POINT FOUR FEET WITHIN THE CURB LINE.

6 INCH PIPE.	9 INCH PIPE.	12 INCH PIPE.	18 INCH PIPE.	TOTAL LINEAR FEET.
192,676	9,258	470	38	202,442

And hence $\frac{202442}{5280} = 38.341$ miles. Of the foregoing 192,676

linear feet of 6 inch pipe, 100,058 linear feet were put in by contract, under special assessment, the contractors furnishing all the materials and doing the work in accordance with the general specifications, and under the rigid inspection of this department, the average cost of the same, in place, ready for use, being $38\frac{1}{2}$ cents per linear foot. By referring to tables "F," "G" and "H" it will be seen that the additions to the primary drainage system made during the year just closed were 25.014 miles, and by a similar reference to table "K," the additions made to the secondary or house-drainage system are shown to have been 38.341 miles, and hence $25.014 + 38.341$ shows the total construction of new work during the past year to have been 63.355 miles, which likewise represents the total additions made to the general sewerage and drainage system of the city of Chicago for the year 1881. This is almost 24 miles in excess of the total construction of new sewers and drains during the year 1880, the additions made during the latter year having been 15 miles to the primary system, and 24.373 miles to the secondary system, or a total for that year of 39.373 miles; and this, added to the extensions made the past year of 63.355 miles, shows the total construction for the years 1880 and 1881 to have aggregated 102.728 miles, which is also a correct measure of the amount of work done by the Sewerage Department for the period covered by those two years.

The following table shows the number of house drains put in under special assessment in the three divisions of the city during the year 1881:

"L."

DIVISIONS.	6 INCH.
North.....	171
South.....	959
West.....	948
Total.....	2,078

The total length of the above 2,078 house drains is, as al-

ready stated, 100,058 linear feet, and the cost, in place, ready for use, 38 $\frac{1}{4}$ cents per linear foot.

The following tabular statement is a correct exhibit of the number of permits issued, and of the general business transactions of the Bureau of House Drains far the year ended the 31st of December, 1881:

"M."

DIVISIONS.	18 Inch.	12 Inch.	9 Inch.	6 Inch.	Total Permits Issued.	Income derived from Permits issued to property owners direct.	Income derived from Licenses and other sources.	Income derived from Permits collected by special assessments.	Total Income for the year 1881.
North.....		7	34	411	445	\$2,565 00			
South.....			107	738	852	4,730 00			
West.....	1	5	97	1,332	1,435	7,600 50			
Totals.....	1	12	238	2,481	2,732	\$14,895 50	\$365 73	\$13,735 80	\$28,997 03

As pertinent to this branch of the subject now under consideration, I regard the attention bestowed upon the theory and practice of house-drainage as very far from what its conceded importance to the general health and sanitary condition of this city demands. So far as the power conferred by law upon this department has permitted me to act, I have exerted myself to correct many objectionable features in the system of house-drainage that have almost become chronic in this community; in which connection new rules and regulations have been prepared and rigidly enforced, governing the method in which all house-drainage work shall be executed, together with accompanying specifications, in which the manner of doing all such work, and the character and quality of the materials to be used therein are clearly and carefully defined. The force of house-drain inspectors has been doubled, and great care exercised in their selection and subsequent instruction. Known to be honest, competent, and experienced men, and carefully trained in the proper manner of discharging the important duties committed to their keeping, much has been accomplished toward the attainment of a reliable sanitary standard, and yet much remains to be done. It is to be regretted, however, that in the absence of much needed legislation, reform in this

direction is necessarily slow, while the health, and consequently the productive capacity of our people suffer in a corresponding ratio, because usefulness ceases the moment health is impaired. Pure water, pure air, pure nutritious food, personal cleanliness and plenty of sunlight are the elements vital to the preservation of health and life, and unless obtained and conserved, disease and prostration follow, and an enfeebled community is the result. Manifestly it is safer to inhabit a healthy domicile with unhealthy external surroundings, than it is to occupy an unhealthy abode, whose superficial external surroundings are of a healthy character. Applied to a system of house drainage, this proposition would imply comparative security from the dangers of sewer gas or sewer air contamination, provided scientific experience and practical skill are honestly applied in planning, ventilating and constructing the drainage and plumbing work of the houses we occupy. And such would appear to be the teachings of modern sanitary science, altho' that science has scarcely reached the dignity of exactitude as understood and measured in the light of the world's knowledge and experience at the present time. Hence the urgent necessity that exists in this community for the speedy enactment of a broad and well defined law, placing the absolute control of this all important question of house-drainage in the hands of a department rendered competent by *education* and *experience* to define, to plan, and to give proper direction to the subsequent execution of all such work. And such department—call it by whatsoever name you please—should have unrestricted and unlimited control of the entire sewerage and drainage system of the city, including all external and internal house drainage and plumbing work, from turret to foundation stone. As a mere question of preservation of health, I can but regard the condition of the main sewers, so far as cleanliness is concerned, as of inferior importance to the condition of the house drainage systems, provided always, that the sites upon which our dwellings are erected, are amply protected by a thorough system of subsoil drainage, that the sewerage and drainage systems of the houses themselves are properly connected with the main sewers as regards outward

flow, and properly disconnected as regards *inward flow* or back pressure of sewer air; the running traps which effect this being provided with foot ventilation on their inner sides, the pipes composing the entire systems inside the curb lines being made of cast iron, the soil pipes and their companions, the ventilating pipes, carried vertically through the houses and above the roofs, the soil and waste pipes properly ventilated and all connections carefully trapped, and again, by a second system of connection into the ventilating pipes, the integrity of the water seals be assured and siphonage prevented, if proper attention be paid to heating and ventilation, the cold air ducts to the furnaces being carried inwardly from the rear of the houses and never less than 10 feet above the ground, then it is suggested the citizens of Chicago may regard themselves and their families as comparatively secure from the dangers of zymotic disease, arising from defective house drainage and still more defective plumbing work, notwithstanding the main sewers may be foul and filled with noxious gases of organic decomposition, as all sewers in "combined" systems receiving the filthy surface drainage from the still more filthy streets necessarily must be, to a greater or lesser extent. When the correct sanitary standard is reached, as reached it can be, if the practical method herein outlined is allowed to obtain, and then to be honestly followed, untrammelled by charlatanism and defined and protected by law, and when mere laymen are taught to cast aside the preposterous assumption that each and every man is competent to dictate the design for his own house drainage, then, and not until then will this important center of population and of commerce assume the position in the sanitary scale which her exceptional surroundings and salubrious location entitle her to occupy among her sister cities of the world.

"N."

During the year 1881, 646 pieces of new junctions were set, at various points in the main sewers, classified as follows:

156 pieces	6-inch	slant junctions.
235	"	9-inch " "
13	"	12-inch " "
1	"	18-inch " "

85	"	12-inch by 6-inch	"Y" junctions.
14	"	15-inch	6-inch " "
5	"	18-inch	6-inch " "
130	"	12-inch	9-inch " "
2	"	18-inch	9-inch " "
5	"	15-inch	9-inch " "

MAINTENANCE AND REPAIRS, 1881.

The various amounts appropriated for the past year were: For "Construction," \$200,000; "Cleaning Sewers and Catch Basins," \$36,000; "Repairs," \$6,000; and for "Adjusting Man-Holes and Catch-Basins to grade," etc., \$16,000; and the following tabulated exhibits show how and for what the last three items were drawn against, and the various amounts expended:

COST OF CLEANING THE PRIMARY SEWERAGE SYSTEM FOR
THE YEAR ENDING THE 31ST DECEMBER, 1881.

[illegible]

RECAPITULATION.

COST OF CLEANING SEWERS.

107 days of general foreman, including horse and wagon, @ \$5.00 per diem.	\$ 535 00
939 days of assistant foreman, @ \$2.75 per diem.....	2582 25
4278 days of common labor, @ \$2.25 per diem.....	9625 50
722 days of double teams, wagons and drivers, as follows:	
531 days, @ \$3.00 per diem..	\$1593.00
191 " @ 4.50 " " ..	859.50
	2452 50
167 days of flushing team and driver, as follows :	
32 days @ \$5.50 per diem....	\$ 176.00
135 " @ 8.00 " " ...	1080.00
	1256 00
11 days of single horse, wagon and driver, @ \$1.75 per diem.....	19 25
	\$16470 50

And hence we have $\frac{689037}{5280} = 130.5$
miles, and $\frac{1647050}{1305} = \$126.21$ per mile
of sewers actually cleansed.

COST OF CLEANING CATCH BASINS.

183 days of general foreman, including horse and wagon, @ \$5.00 per diem.	\$915 00
954 days of assistant foreman, @ \$2.75 per diem.....	2623 50
3185 days of common labor, @ \$2.25 per diem.....	7166 25
Carried forward.....	\$10,704 75

Brought forward.....	\$10,704 75
680 days of double teams, wagons and drivers, as follows:	
167 days, @ \$3.00 per diem..	\$ 501.00
513 " @ 4.50 " " ..	2308.50
	\$2809 50
6 days of single horse, wagon and driver, @ \$1.75 per diem.....	10 50
	\$ 13524 75

And hence we have $\frac{13524.75}{6551} = \$2.06$
as the actual cost of cleaning each catch
basin.

COST OF ATTENDING TO COMPLAINTS, OPENING INLETS, ETC.

12 days of general foreman, including horse and wagon, @ \$5.00 per diem.	\$ 60 00
502 days of assistant foreman, @ \$2.75 per diem.....	1380 50
1172 days of common labor, @ \$2.25 per diem.....	2637 00
27 days of double teams, wagons and drivers, as follows:	
21 days, @ \$3.00 per diem....	\$ 63.00
6 " @ 4.50 " "	27.00
	\$ 90 00
278 days of single horse, wagon and driver, as follows:	
97 days, @ \$1.75 per diem....	\$169.75
181 " @ 2.75 " "	497.75
	667 50
	4835 00
	\$34830 25

And hence we have \$34830.25 as the total cost of cleaning
the general system, as set forth in detail in table "A," in-
cluding the 10610 receiving basins, as shown in table "J,"
and this sum, divided by 362.266 miles, shows the cost per
mile to have been \$96.14 for the year 1881.

"Q."

REPAIRS OF MAN HOLE AND CATCH BASIN COVERS.

No.	DESCRIPTION OF WORK.	COVERS.			Days of foreman.	Days of com. lab'r	Days of h'fre wagg and dry'r
		WOOD.		IRON.			
		New.	Old.				
965	Manhole covers	122	95	24	312	312	335
610	repaired....						
	Catch basin						
	cov. repair'd						
24	Iron manhole						
	cov. repair'd						
		\$3.73 Each.	\$1.35 Each.	\$4.90 Each.	\$2.50 per day.	\$2.25 per day.	\$2.29 per day.

An analysis of the foregoing tables, "P" and "Q," will show the cost of the different kinds of work detailed therein.

CONSTRUCTION.

During the year 1881 the primary system has been enlarged and extended by the construction of 132076 linear feet of new main, sub-main and branch sewers, the details of all of which are given in the following tabulated statement,

"R."

Length in Feet.	DESCRIPTION.	Ave'ge depth of trenches in feet.	Int. diameter in inches.	Average cost per foot, in place, ready for use.
58442	Pipe sewers.....	7.50	12	\$ 1 14
15979	" "	6.70	15	1 33
14270	" "	8.00	18	1 88
11932	Brick "	8.45	24	2 08
6597	" "	10.08	30	2 41
5835	" "	8.40	36	3 22
6636	" "	8.60	42	3 49
2655	" "	7.50	48	3 90
2655	" "	7.50	54	4 35
1034	" "	6.80	72	5 59
2250	" "	11.00	96	11 26
3791	" "	10.00	108	14 01

132076 linear feet = 25.014 miles.

The total cost of the foregoing 25.014 miles, in place ready for use, together with the adjunct man holes, which, on the main sewers, average 300 feet apart, and on the sub-mains and laterals, or branches, 130 feet apart, was \$303,287.19, or at the rate of \$12,124.72 per mile. The details of the foregoing are about as follows: The Department furnishing all the materials and delivering the same alongside the trenches, the contractors simply furnishing the labor and sand—Division Engineers, \$150 per month; Rodmen, \$75 per month; Inspectors of Sewerage Work, \$3.25 per diem; Inspectors of Bricks, Pipe, etc., \$2.50 per diem; Foreman in charge of the delivery of materials, \$2.50 per diem; Helpers to latter, \$2.25 per diem; double teams, wagons and drivers, average for the season \$3.62 per diem; bricks, \$11.17 per thousand; cement, \$1.25 per barrel; 12-inch straight pipe, 37 cents per foot; 15-inch do., 50 cents per foot; 18-inch do., 75 cents per foot; 12-inch "Y" junctions, 75 cents per foot; 15-inch do., \$1.00 per foot; 18-inch do., \$1.50 per foot; 12-inch slants, 55 cents per foot; 15-inch slants, 75 cents per foot, and 18-inch slants, \$1.10 per foot. Timber man hole frames and covers, \$3.73 each; cast-iron man hole frames and covers, \$14.46 each; sand, 66 cents per cubic yard. Pine lumber, \$15.00 and \$17.00 per thousand feet, board measure; oak do., \$26.50 per thousand feet, board measure; white oak sheeting \$28.00 per thousand feet board measure. The prices paid by the contractors were about as follows: Foremen, \$4.00 per diem; first-class masons, \$7.00 per diem; second class masons, \$5.00 per diem; laborers, graded at \$2.50, \$2.00 and \$1.50 per diem.

The total cost of the primary drainage system of the City of Chicago, which aggregated 362.266 miles on the 31st day of December, 1881, as set forth in table "A," together with its adjunct man holes and receiving basins, as exhibited in table "J," was \$5,786,425.58, or \$15,972.86 per mile, and its construction has covered a period of twenty-five years, the original surveys having been commenced in 1855, and the first sewer constructed in the Summer of 1856. As illustrative of the comparative position occupied by this city, and the de-

gree to which her sanitary needs have been cared for, the following original tabular exhibit of the characteristics and extent of the general sewerage and drainage systems of twelve of the principal cities of the United States is herewith submitted, in the confident expectation that its perusal will prove to the citizens of Chicago that, as compared with other and older centres of population, the work of draining their city has not been neglected, nor its vital importance to their health and life disregarded.

"S."

	CITIES. 31st December, 1881.	Population by Census of 1880.	Area in Acres.	Linear feet of Sewers in Use.	Density of Popu- lation per Acre.	Square feet of Area per capita.	Linear feet of Sewers per Acre.	Linear feet of Sewers p'r capita
1	New York.....	1206299	26401	2086082	45.69	953	79.01	1.73
2	Philadelphia.....	847190	82803	1082400	10.23	4258	13.07	1.28
3	Brooklyn.....	566663	13338	1615680	42.48	1025	121.15	2.85
4	Chicago.....	503185	22797	1912765	22.07	1974	83.90	3.80
5	Boston.....	362839	4416	1099913	82.16	530	249.07	3.03
6	St. Louis.....	350518	40000	1108810	8.76	4971	27.73	3.11
7	Baltimore.....	332313	7949	58080	41.81	1042	7.31	0.17
8	Cincinnati.....	255139	15360	351130	16.61	2622	22.86	1.38
9	San Francisco.....	233959	26880	660000	8.70	5005	24.50	2.82
10	Cleveland.....	160146	17165	449698	9.33	4669	26.19	2.81
11	Providence.....	104857	10116	233540	10.37	4202	23.09	2.23
12	Memphis.....	33592	2300	184400	14.61	2983	80.17	5.49

The controlling topographical features of this locality, together with the fact that the average elevation of the site occupied by the City of Chicago above the surface of Lake Michigan and the Chicago River is only some eleven feet, render the task of draining this city through its sewerage system anything but an easy one, consequently the standard gradients upon which all our sewers have been, and are being constructed, are exceedingly low, as may readily be perceived by referring to the following:

TABLE OF GRADIENTS.

INTERIOR DIAMETER OF SEWERS IN INCHES.	GRADIENTS IN DECIMALS OF A FOOT, PER 100 FEET.
12 inch pipe.....	0.20 of a foot.
15 " "	0.20 " "
18 " "	0.20 " "
20 " "	0.10 " "
24 " brick.....	0.10 " "
30 " "	0.10 " "
36 " "	0.06 " "
42 " "	0.05 " "
48 " " and all over this size	0.04 " "

Whenever it has been found practicable to increase these gradients within prudent limits, I have never failed to avail myself of the opportunity to do so, the instances being rare, however, in which it has been possible to attain an inclination sufficient to give a theoretical velocity of flow very greatly in excess of four feet per second, which latter, nevertheless, I am inclined to regard as ample in this system for all self-cleansing purposes, while experience would appear to indicate a velocity of six feet per second as a maximum it would be imprudent to exceed.

Another serious drawback resulting from this condition of things, is our consequent inability to use any shape but the circular in the construction of all our sub-main brick sewers, notwithstanding the well authenticated fact that the egg-shaped conduit is the best form, theoretically and practically, for all sewers executed in brick masonry, and whose diameters are required to be in excess of eighteen or twenty inches, unless the flow of sewage is constant, and always in sufficient volume to keep the sewer never less than half full, which latter is generally the condition of main sewers at all seasons, but rarely that of sub-mains or branches, the dry weather flow of sewage matter in the latter being at times but a mere thread pursuing a serpentine course along the bottom of the channel-way, while during the prevalence of rain storms the same sewers will be

found running full bore, and not infrequently under a hydraulic head. In my report for the year 1880 attention was called to the subject of sewer ventilation generally, and at the same time it was given as my opinion that the only feasible and practicable method by which the sewerage system of Chicago could be efficiently ventilated, was by placing perforated covers on all the man-holes, and assisting these, and increasing the atmospheric currents through the sewers by the construction of trapless catch-basins. At the same time the possible existence or some objectionable features in connection with the use of untrapped catch-basins was frankly admitted, because of their greater proximity to the houses, as compared with the open man-hole covers in the centers of the streets; and it was remarked that such objections would undoubtedly apply with greater force if the catch-basins were to be depended upon alone, as the channel of ventilation. Attention was also invited to the fact, that even at that date, and while the system suggested was practicably in its infancy, the complaints of the presence of sewer gas in the interior of dwellings and business houses were decreasing in number and frequency, which of itself seemed to indicate that the plan then outlined, and in fact practically adopted, pointed to the gradual but certain mitigation of the evil, and it was claimed that if the system of ventilation thus inaugurated was steadily pursued, an absolute eradication of the trouble might be legitimately expected at an early day. A year has now elapsed since these views were put forward, and I am happy to say that anticipations alike hoped for and expected have been fully realized. During the year 1881 the introduction and constant use of both the open man-hole covers and the construction of the untrapped catch-basins has continued without interruption, and to-day there are fully four thousand of the former and one thousand of the latter in place and in use, with results which may be summed up by saying that for the year just closed but two complaints have reached this department in regard to the untrapped catch-basins, both of which were promptly remedied without change of plan, and three complaints about offensive odors arising from the perforated man-hole covers, while the number of complaints of

the presence of sewer gas in dwellings, which during 1880 certainly averaged from three to five per diem, did not in 1881 reach twenty cases during the entire year. *Experimentum crasis.* To the foregoing, together with the fact that the entire sewerage system has been pretty thoroughly cleansed and flushed out, must be ascribed the comparative absence of sewer gas from the habitations of our people during the past year, and hence I consider myself fully justified in recommending a strict adherence to the plan of ventilation now in use, and which, if continued and intelligently extended, cannot fail to attain a safe and reliable sanitary condition at an early day. Some fears have been expressed that the foul air passing through the perforated man-hole covers and from out the untrapped catch basins might reach such proportions as to injuriously affect the surrounding atmosphere, and that the air, thus contaminated, might find its way into our dwellings and sleeping apartments. Aside from the well authenticated fact that the currents passing through the man-holes and catch-basins are as often inward as outward, the immense disproportion between the largest volume of sewer gas or sewer air that could possibly reach the surface, and the volume of the surrounding atmosphere it would come into immediate contact with at that point is, of itself sufficient to banish all such apprehensions. It is regarded as being within reasonable limits to say that every unit of foul air which passes from out the sewers, encounters not less than ten thousand units of pure atmosphere the moment it reaches the surface of the streets, or in an infinitesimal period thereafter, and as a natural consequence the absolute dilution and resulting attenuation must be, and is, in a corresponding ratio.

The most superficial knowledge of the universal action of the law of the diffusion of gases, is sufficient to show how purely imaginary are the apprehensions that the vast volume of superincumbent atmosphere that surrounds us can, by any possibility, be affected in the most minute degree, much less be injuriously contaminated by the insignificant and intermittent volume of foul air passing from out the sewers by the

method of ventilation now, and for upward of two years past, in successful operation in the Sewerage system of this city. Sewer gas, or Sewer air, beyond its enervating effects upon the human system, cannot be regarded as dangerous, *per se*. It is only when it becomes the vehicle for the transmission of bacteria, or, if you please, of the germs of disease, that its presence in the air we breathe is to be regarded as pernicious and its inhalation destructive of health and life.

So long as sewers are thoroughly cleansed and flushed out, and kept in that condition, the gradients upon which they are constructed being sufficient to assure a velocity of flow of about three feet per second, the smoother the interiors, the fewer the structural defects, and the greater the absence of porosity—in other words, the nearer we can approximate the condition, or, better still, the actual use of pipes, be they cast-iron or vitrified clay, or other equally good and impervious material, then the more certainly do we ensure the rapid and thorough removal of the foul sewage out from and away from the habitations of people, and, as a natural consequence, the dangers of organic decomposition and the inevitable generation of the noxious gasses of fermentation are greatly lessened, while the chances of sub-soil pollution, in itself one of the most prolific sources of disease and death, are correspondingly reduced if not absolutely destroyed. Another and a most fruitful source of sub-soil pollution in this city is the presence and constant use of some thousands of foul cesspools and privy vaults. These vile receptacles of household refuse and human dejecta, reeking with filth and exhaling the vilest odors, are simply sanitary horrors bequeathed us by the ignorance of a past age, and, sad to tell, still tolerated and maintained by an amount of stupidity whose existence can only be ascribed to an utter absence of the most primitive information, and whose presence in our midst, and continued use, are simply the result of ignorant indifference on the part of our law givers approaching criminality. These sinks of iniquity should be obliterated from off the face of the earth. All houses should be properly connected with the main sewers before oc-

cupancy as human habitations, and the extension of all sewerage systems, or parts of such systems, should be co-existent with the construction of the dwellings themselves. Sewers that are intelligently designed, honestly constructed, and faithfully maintained, rarely give off offensive odors, and these latter, when detected, should always be regarded as a species of notification that something is wrong within the sewers—something that should never fail to receive prompt attention, and when the nature of the trouble is subsequently ascertained, should be immediately remedied. In the construction of these subterranean drain-ways it is absolutely essential to their successful operation that when finished they should be “sewers of transmission,” and *not* “sewers of deposit.” This proposition renders apparent the overshadowing importance of correctly proportioning all sewers to the areas to be drained, to the duty they are expected to successfully perform, and from this the deduction seems both natural and logical, that within limits ascertained by careful calculation and dictated by considerations of prudence and economy, the substitution of highly glazed or smoothly finished pipes in place of the rougher and larger brick sewers, will largely assist our approach toward the attainment of sanitary perfection in this branch of constructive art. But when the drainage requirements demand the adoption of sewers whose dimensions and structural features are of such magnitude as to compel a resort to the use of bricks as a material of construction, then it is suggested that great care should be exercised in the practical execution of all such work, the most thoroughly burned and denser varieties of bricks alone should be used, and the smoothest and best finished of these should be culled out and placed in the inverts, which latter should be laid up in pure cement only, with all interior mortar joints carefully struck and rubbed smooth and uniform throughout, and every effort exerted to make the finished work as nearly impervious as possible, and hence, while reducing the chances for sub-soil pollution to a minimum, to correspondingly decrease the resistance to flow of the sewage matter, and thereby hasten its transmission to some point remote from the immediate vicin-

gravest objections in a sanitary point of view, compared with which the question of mere economy approaches insignificance.

In my report for the year 1880 I had occasion to remark that the flat gradients upon which the sewers of Chicago were constructed, coupled with the fact that the heads or "dead ends" of the sub-main and lateral or branch sewers were rarely more than five or six feet below the surface of the streets, obviously presented some obstacles to the introduction and successful use of permanent flush tanks, or similar contrivances, that it would be found difficult to surmount. The practical effect of a flush which simply means the length of a sewer which it will thoroughly cleanse or wash out, depends upon the volume of water used and the head under which it is made to act. Manifestly a hundred cubic feet of water forced into a sewer under a head of ten or twenty feet and in a column whose diameter is equal to that of the sewer, the entire body of water doing its work with a rush, as it were, will unquestionably do more effectual duty than a thousand cubic feet acting under a much greater head, but only reaching the sewer in a small continuous stream. The two portable flush tanks belonging to and used by this department, hold 239 and 280 cubic feet of water, respectively, and these volumes are discharged into the sewers of two feet diameter and less, through pipes of slightly smaller area, and under heads of ten to sixteen feet. In the same report, when referring to the use of the water mains for flushing purposes, I stated that they would undoubtedly do the work, provided their areas were sufficiently large at points where connections with the sewers were found necessary. If such was not the case then it would become imperative to impound the water in quite a length of the sewer by the use of fixed valves or flushing gates, objectionable in most places, but particularly so in this city because of the danger to be apprehended from the impounded water and sewage backing up through the house drains and flooding the adjoining premises.

In conclusion I beg to invite your attention to the urgent

necessity that exists for providing drainage facilities for the western, northwestern and southwestern portions of the city, in which connection I deem it obligatory that I urge the early completion of the main intercepting sewer in west 22d street, (at present finished and in use from Leavitt street to a point near Central Park avenue) westwardly in 22d street to Crawford avenue, and eastwardly in 22d street to Laflin street, and thence southward in Laflin street to its outfall at the foot of the latter street, where the entire volume of its discharge will be brought within the influence of the pumping works now in course of erection at Bridgeport. Properly designed and constructed, and with storm water overflows and back water gates on its southerly side in Leavitt street and in Western and California avenues, this sewer will take care of all the drainage brought to it by the sub-mains northward of 22d street, located in Ashland avenue, Wood, Robey and Leavitt streets, and in Western, California, Kedzie and Central Park avenues; and as a much needed extension of this system, I recommend the immediate construction of the sub-main sewer in Kedzie avenue, from 22d street to Kinzie street, with an interior diameter of five feet at its junction with the intercepting sewer in 22d street and gradually decreasing to a diameter of two feet at Kinzie street. The drainage of that portion of the city between the west fork of the South Branch and 22d street, and generally between Laflin street on the east and Crawford avenue on the west, should be carried into an intercepting sewer located along the north shore of the west fork of the South Branch, which in turn should discharge into the main intercepting sewer in 22d street, at or near its intersection with Blue Island avenue. No sewage should be discharged into the west fork of the South Branch, nor, as a rule, into any stream or estuary uninfluenced by hydraulic reaction in some form, either natural or artificial.

But little more, if anything, can be done to meet the increasing demands for drainage in the northwestern portion of the city by any extension of the present sub-systems in that direction. At an early day a large main sewer will have to

be constructed, having its outfall at some point on the west shore of the North Branch between Canal place and Wau-bansia avenue. I recommend the early construction of this sewer, westward from the river to North Wood street, thence southward to North avenue, thence westward to Leavitt street, thence southward to Hirsch street, thence westward to California avenue, thence southward to Augusta street, and thence westward to the city line at Crawford avenue. This sewer, correctly designed and located as to area, dimensions and gradients, and with its accompanying system of sub-main and branch sewers, will effectually drain the district lying between North avenue and West Kinzie street, and between North Leavitt street and Crawford avenue; and, by a judicious location and arrangement of a sub-system, discharging into the main sewer where the latter intersects North Wood street, the district lying between North avenue on the south, Western avenue on the west and the North Branch of the Chicago river on the east, will be effectually drained.

The drainage of that portion of the city lying between the canal and Egan avenue, and the south fork of the South Branch of the Chicago river and Western avenue, should be provided for at an early day by extending the sewer in Archer avenue from its present terminus at Wood street, to Western avenue, and by the construction of sewers in Thirty-fifth street, from the south fork of the South Branch to Western avenue; in Thirty-third street, from Ashland avenue to Oakley street; and when required, in Thirty-seventh street, from the south fork to Western avenue. All this work in these outlying portions of the city is sadly needed, and nothing should be allowed to stand in the way of its construction at an early day.

The past year has been remarkably free from all species of annoyance usually regarded as inseparable from public work of all kinds. Under your wise administration, and particularly while you have been in direct and active charge of the Department of Public Works, the business and general oper-

ations of the Sewerage Department have progressed in a manner highly satisfactory and extremely pleasant to all concerned; the contractors have all executed their work in an unusually commendable and faithful manner, and the cost of new construction, of maintenance and repairs, and of operation has, I am happy to say, fallen considerably within my original estimates. That much of this is due to your sensible views as to the manner in which all public business should be transacted, is conceded with pleasure, and I congratulate you upon the attainment of results that speak for themselves.

In regard to the manner in which all the attachés of this department have performed their various and onerous duties during the year just closed, I cannot speak too highly. Faithful to the important trusts committed to their care, I can make no distinctions that would not be alike invidious and unjust. All have proved themselves eminently efficient, and all have been equally devoted to the discharge of the duties belonging to their respective positions, and hence I am in turn simply discharging an obligation which their unselfish sympathy and support has imposed upon me, when I close this report by sincerely commending them all to your kind and impartial consideration.

G. HOWARD-ELLERS,

Sup't of Sewerage.

BOOK-KEEPER'S STATEMENT

FOR 1881.

CHICAGO, December 31st, 1881.

HON. CARTER H. HARRISON, MAYOR,

In charge of Department of Public Works,

DEAR SIR:—I herewith respectfully submit my report of the receipts and expenditures of the Department of Public Works from January 1 to December 31, 1881:

WATER FUND.

RECEIPTS.

<i>Acc't Current Rents:</i>	
Am't collected during the year.....	\$ 936,802 14
<i>Acc't Water Service Cocks:</i>	
Am't rec'd for taping permits.....	25,335 20
Am't rec'd for plumbers' licenses	139 00
Am't rec'd for labor and material.....	293 06
	25,767 26
Carried forward	
	\$ 962,569 40

Brought forward \$ 962,569 40

Acc't Water Works Repairs:

Am't rec'd for shutting off and letting on....	604 61	
Am't rec'd for sprinklers' licenses.....	310 00	
Am't received for labor and material furnish'd for removing hydrants and repairing pipes and stop cocks.....	5,357 28	
		6,271 89

Acc't Water Pipe Extension:

Am't received for labor and material furnish'd private parties for lay- ing water pipes and for scrap iron, pipe and castings sold....		6,128 30
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Acc't Water Meters:

Am't rec'd for meters, fittings, and setting meters.....	10,092 98	
Am't rec'd for labor and material furnished for laying water pipes for elevators supply.....	27,835 00	
Am't rec'd for repair- ing private meters...	1,469 04	
		39,397 02

Carried forward		\$1,014,366 61
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Brought forward		\$1,014,366 61
<i>Acc't North Pumping Works:</i>		
Am't rec'd from R. S.		
Hill, one-half forfeit-		
ure of coal contract..	100 00	
Am't rec'd from D. C.		
Cregier for over-allow-		
ance on September		
pay-roll.....	14 00	
Am't rec'd from Street		
Department for labor		
and material used fill-		
ing streets.....	56 50	
Am't rec'd for labor and		
material furn'ed Ful-		
lerton avenue conduit.	15 11	
Am't rec'd from Bridge		
Department for labor.	6 17	
		191 78
<i>Acc't West Pumping Works:</i>		
Am't rec'd from R. S.		
Hill, one-half forfeit-		
ure of coal contract..	100 00	
Am't receiv'd from Hy.		
Mason for oil barrels		
and waste oil sold....	61 00	
Am't received from Hy.		
Mason over-allowance		
on pay-roll.....	12 00	
		173 00
<i>Acc't Water Works Shops:</i>		
Am't rec'd for scrap iron		
sold.....	369 60	
Am't rec'd for valves and		
castings sold.....	94 49	
Carried forward	464 09	1,014,731 39

Brought forward	464 09	1,014,731 39
Am't rec'd from appropriation fund for labor and material furnish'd:		
Street Dept. \$	43 09	
Bridge "	28 88	
Fullerton ave conduit....	213 51	
Riv. impr'vements	12 56	
		298 04
		762 13

Acc't Miscellaneous Receipts:

Received from Scott & Gage, water taxes. . .	8 92	
Rec'd from City Collector, delinquent taxes..	9 00	
Rec'd from City Comptroller, tax redempt's.	1,050 05	
Rec'd from sundry persons, deposits for loan of wrenches	290 00	
Rec'd from T. T. Gurney, Comptroller, amount previously drawn to accommodate Water Office in making change.....	1,000 00	
Rec'd from F. C. Meyer, Book-keeper, amount previously drawn to accommodate Water Office in making change.....	1,000 00	
Carried forward	\$ 3,357 97	\$1,015,493 52

Brought forward.	\$	3,357 97	1,015,493 52
Rec'd from salary acc't, amount paid back....		20 00	
Rec'd from A. Knisely, boarding laborers at crib.....		6 00	
Rec'd from Mead & Coe, agt's, am't advanced to lay water pipes...		621 40	
Rec'd from Wm. Deering, am't advanced to lay water pipes.....		100 00	
Rec'd from Albert Crane am't advanced to lay water pipes.....		1,110 00	
Rec'd from C. & A. R. R. Co. amount ad- vanced to lay water pipes.....		803 06	
Rec'd from Julia F. Por- ter am't advanced to lay water pipes.....		185 90	
Rec'd from Adele F. Adams am't advanced to lay water pipes....		638 10	
Rec'd from Clara F. Bass am't advanced to lay water pipes.....		1,195 80	
Rec'd from N. C. City R. R. Co. amount ad- vanced to lay water pipes.....		425 00	
Rec'd from Chas. Coun- selman & Co. amount advanced to lay water pipes.....		566 40	
Carried forward.	\$	9,029 63	\$1,015,493 52

Brought forward.	\$ 9,029 63	1,015,493 52
Rec'd from J. B. Thompson, guaranty on his proposal for new engines	2,000 00	
		\$11,029 63
Total receipts.....		\$1,026,523 15

EXPENDITURES.

Acc't Water Pipe Extension:

Paid for:

Iron water pipe.....	\$ 79,882 22
Labor.....	48,653 62
Special castings.....	21,311 42
Bricks.....	3,741 00
Cement.....	1,347 70
Coal.....	34 90
Sewer pipe.....	272 60
Sand....	204 88
Lumber.....	2,545 40
Lead.....	5,072 71
Gasket and packing...	245 08
Oil, paint, brushes and glass.....	122 58
Tar.....	4 80
Powder and fuse....	78 65
Chain and rope....	84 05
Lime.....	1 40
Hardware.....	313 05
Iron work.....	14 25
Pipe fittings.....	21 37
Tools.....	147 44
1 scale.....	82 00

Carried forward. \$ 164,181 12

BOOKKEEPER'S STATEMENT.

157

Brought forward.	\$ 164,181 12	
10 loads brush.....	15 00	
Furnace stack.	11 00	
Iron plugs.....	20 09	
Teaming.....	4,132 32	
Plumbing.....	617 95	
Replacing pavement.	9,246 65	
Rebates.....	66 81	
Freight.....	64 36	
Use of stone jack...	69 00	
Use of tug.....	132 05	
Advertising.....	246 12	
Royalty.....	90 00	
Repairing wagon and harness.....	30 35	
1 blank book.....	6 00	
Cash payments ...	\$ 178,928 82	
Add amount transferred from:		
Water Works		
Shops	17,783.45	
North Pump- ing Works..	48.93	
Water Works		
Stables	269.93	
Water Meters.	351.21	
	<u>18,453 52</u>	
	\$ 197,382 34	
Deduct am't transferred to Water Meters.....	15,811 84	
	<u>\$ 181,570 50</u>	
Carried forward.		\$ 181,570 50

Brought forward. \$ 181,570 50

Acc't North Pumping Works:

Paid for coal.....	77,902 30
Labor.....	22,628 14
Steam fitting.....	31 51
Leather.....	1 75
Rubber belting.....	21 63
Oil, paint, turpentine, etc.....	972 78
Gasket and packing..	313 62
Hardware.....	72 51
Castings.....	297 94
Iron.....	29 88
Zinc.....	5 20
Wire.....	16 89
Soap.....	28 45
1 body-piece for pump	90 00
Charts for recording gauge.....	4 00
1 globe valve.....	3 08
Repairing boilers....	820 29
Lumber.....	324 03
Hose and other rub- ber goods.....	156 63
Cement.....	29 70
Lead.....	9 95
Lime.....	1 50
Lamp burners and globes.....	2 25
Repairing roof.....	74 08
Brooms.....	14 50
Scoops and shovels..	24 00
Gas governor.....	40 50
Lightning rods.....	15 00
Rope.....	32 64
1 wrench.....	88

Carried forward. \$103,965 63 \$ 181,570 50

BOOKKEEPER'S STATEMENT.

159

Brought forward.	\$103,965 63	\$181,570 50
Planking roadway...	374 50	
Gas	1,273 46	
Lamps	8 25	
Teaming.....	1,051 94	
Advertising.	27 07	
Repairing telephone.	3 95	
2 batteries.	3 00	
Repairing clock.....	1 00	
Oats and oatmeal....	49 00	
Repairing wagons...	85 83	
Grass seed.....	5 00	
Ice.....	9 80	
Blank books and stationery.....	18 10	
Cash payments. ...	\$106,876 53	
Add amount transferred from Water Works Stables	135 18	
	<u>\$107,011 71</u>	
Deduct amount transferred to:		
Water Pipe Extension...	48.93	
West Pumping Works...	11.81	
Lake Tunnel Crib.....	6.55	
Water Works Stables.....	.70	
Pump'g Lake Tunnel.....	10.36	
Carried for'd.	\$ 78.35	\$107,011 71 \$181,570 50

Bro't forw'rd.	\$ 78.35	\$107,011 71	\$181,570 50
New Eng. W.			
Pump'g W'ks	23.63		
Water Works			
Shops.....	474.08		
		\$576 06	
			\$106,435 65

Acc't West Pumping Works:

Paid for:

Coal.....	20,868 05
Oil, paint, varnish, &c.	1,539 54
Labor.....	24,054 19
Repair'g engines and machine work....	1,178 51
Waste and packing...	532 92
Steam fitting.....	115 22
Steam jet tubes.....	72 00
One forge.....	22 00
Shovels and other tools	42 27
Hardware.....	109 91
Blacksmithing.....	36 50
Castings.....	1 94
Gauge-glasses.....	3 12
Sheet iron work....	545 64
Rubber valves.....	604 23
Charts for rec'g gauge	4 00
Teaming.....	146 13
Tallow.....	39 74
Hose.....	47 50
Lumber.....	132 01
Cement.....	20 00
Soap.....	77 00
Bricks, clay and lime.	327 65
Terra cotta.....	42 00

Carried forward. \$ 50,562 07 \$ 288,006 15

BOOKKEEPER'S STATEMENT.

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Brought forward. \$ 50,562 07 \$ 288,006 15

Paid for:

Repairing telephone..	5 95
Rubber goods.....	30 00
Repairing tools.....	37 58
Wheelbarrows.....	36 00
Brooms and brushes..	23 92
Rope and blocks.....	39 69
Gas governor.....	38 80
Shaving rakes.....	4 00
2 conv'rs for shavings	17 40
Roofing for shed.....	66 50
Advertising.....	61 16
Freight.....	4 60
Gas	1,790 80
Planking roadway...	649 25
Printing.....	14 75

Cash Payments, 53,382 47

Add amount tranferred
from:

Water works	
shops.....	4.61
N'th pumping	
works.....	11.81

16 42

53,398 89

Acc't Water Meters:

Paid for:

Meters.....	7,045 61
Meter fittings and air	
chambers.....	2,316 26
Hardware.....	104 34
Cement.....	606 15

Carried forward. \$ 10,072 36 \$ 341,405 04

Brought forward.	\$ 10,072 36	\$341,405 04
Meter glasses.....	2 00	
Bricks.....	1,300 00	
Sand.....	109 75	
Sewer pipe.....	155 00	
Lumber.....	394 38	
Packing.....	60 81	
Pig lead.....	659 76	
Plumbing.....	51 47	
Tar.....	4 00	
1 Pressure gauge....	14 00	
Labor.....	15,622 21	
Teaming.....	623 22	
Wax seals and wax...	9 75	
1 horse blanket.....	6 00	
Tools.....	41 29	
Rebates on deposits..	2,110 49	
Fr't and Ex. charges	145 35	
Repairing wagon....	13 10	
Print'g and stationery	36 00	
Cash Payments,	\$31,430 94	
Add amount transferred from:		
Water Pipe		
Extension..	15,811.84	
Water Works		
Stables	653.36	
Water Works		
Shops	1,074.30	
		\$ 17,539 50
		\$ 48,970 44
Deduct am't transferred to Water Pipe Ext'n.	351 21	
		\$ 48,619 23
Carried forward.		
		\$390,024 27

BOOKKEEPER'S STATEMENT.

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Brought forward.

\$390,024 27

Account Lake Tunnel Crib:

Paid for:

Use of tugs and scows.....	\$13,890 18
Labor.....	4,946 51
Chain, rope and blocks	133 58
Lanterns, globes and chimneys.....	3 90
Brooms.....	2 00
Cement.....	257 30
Hardware.....	14 96
Lumber	165 76
Valves.....	10 14
Pails.....	4 50
Coal.....	428 25
Iron.....	38 15
1 set grate bars.....	20 10
Sand	64 50
Packing.....	7 00
Stone.....	303 63
Stone coping.....	285 65
1 guy plate	13 50
Lightning rods.....	28 50
Glass, oil, paint and brushes	118 93
Flag and halyards...	9 90
Repairing roof.....	76 75
Tools.....	5 00
Stone masonry	182 07
Roof for lighthouse..	193 00
Vane, and setting same.....	75 10
Teaming.....	13 33

Carried forward

\$21,292 19 \$390,024 27

DEPARTMENT OF PUBLIC WORKS.

Brought forward.	\$21,292 19	\$390,024 27
Rubber boots.....	26 04	
1 boat.....	50 00	
Boarding laborers...	1,031 20	
Covering ice baskets.	12 00	
Repairing crib boat..	34 50	
Repairing telephone.	8 95	
Blankets.	18 75	
Advertising....	13 78	
Cash payments....	\$ 22,482 41	
Add amount transferred		
from:		
Water Works		
Shops	\$ 227.05	
N'rth pumping		
works	6 55	
		\$ 233 60
		\$ 22,716 01

Account Water Works Repairs:

Paid for:

Coal.....	\$ 68 60
Labor.....	39,844 77
Paint and oil	34 07
Packing.....	4 80
Lumber.....	1,239 83
Cement.....	526 20
Teaming.....	3,722 04
Hose.....	21 17
Sawdust.....	37 50
Iron.....	39 24
Bricks	1,935 00
Powder and fuse.....	13 85
Lead....	500 00

Carried forward. \$47,987 07 \$412,740 28

BOOKKEEPER'S STATEMENT.

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Brought forward.	\$47,987 07	\$412,740 28
Hardware	179 95	
Sewer pipe	45 60	
Sand	24 75	
Felting	21 17	
Rope	4 06	
Error, to Appropriation Fund.....	11 15	
Rebates and dep'ts for wrenches refunded..	292 50	
1 pump.....	400 00	
Plumbing	1,023 06	
Repairing boiler.....	35 84	
Use of tug.....	34 75	
Tools and repairing same.....	66 16	
Repairing wagon....	40 05	
Blank books and printing	77 45	
Cash payments....	\$50,243 56	
Add amount transferred from:		
Water works shops.....	379.44	
Water works stables	530.06	
	<u>\$909 50</u>	
		<u>\$51,153 06</u>

Acc't Water Works Shops.

Paid for:

Castings.....	11,802 07
Labor.....	8,855 12
Coal.....	63 60

Carried forward. \$20,720 79 \$463,898 34

Brought forward.	\$20,720 79	\$463,893 34
Paid for:		
Rubber.....	154 80	
Pipe fittings.....	85 23	
Steel, brass and iron..	573 99	
1 grindstone.....	10 16	
Wire.....	13 01	
Anti-incrustator.....	10 00	
Meter wheels.....	3 12	
Nuts and bolts.....	237 35	
Belting.....	19 35	
Lead and oil.....	25 91	
Lumber.....	8 75	
Gasket and packing..	354 69	
Hardware.....	29 99	
Gas.....	39 60	
Ice.....	9 80	
Blank books.....	4 20	
Tools.....	108 05	
Cash Payments,	\$22,358 79	
Add amount transferred from:		
N'th pumping works.....	474.08	
Water works stables.....	135.18	
	<u>609 26</u>	
	22,968 05	
Deduct amount trans- ferred to:		
Water pipe ex- tension.. . .	17,783.45	
West pumping works.....	4.61	
	<u>17,788.06</u>	
Carried for'd.	\$17,788.06	\$22,968 05 \$463,893 34

BOOKKEEPER'S STATEMENT.

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Bro't forw'rd \$17,788.06 \$22,968 05 \$463,893 84

Deduct amount trans-
ferred to:

Water meters.. 1,074.30

Lake tun'l crib 227.05

Water works
repairs..... 379.44

Water works
stables..... 13.82

Water service
cocks 104.83

Pumping lake
tunnel..... 9.14

Fire cisterns.. 9.94

————— \$19,806 58

————— \$3,861 47

Acc't Water Works Stables:

Paid for:

Labor..... 989 62

Oats and hay..... 1,415 39

Repairing harness.... 122 85

Repairing wagons.... 241 05

Horse shoeing..... 222 70

Horse bl'k'ts and cov's .42 21

Soap and chamois skin 1 40

Cash Payments; 3,085 22

Add amount transferred
from:

N'th pumping
works..... .70

Water works
shops 13.82

————— 14 52

Carried forward, 3,049 74 \$467,254 81

DEPARTMENT OF PUBLIC WORKS.

Brought forward	\$3,049 74	\$467,254 81
Deduct amount trans-		
ferred to:		
Water works		
repairs.....	530.06	
Water service		
cocks.....	1,211.73	
Water pipe ex-		
tension.....	269.93	
Water meters..	653.36	
N'th pumping		
works.....	135.18	
ater works		
shops.....	135.18	
	<u>2,935 44</u>	
		114 30

Acc't Pumping Lake Tunnel:

Paid for:

Labor.....	248 56	
Pipe fittings.....	77 16	
Rent of boiler.....	55 00	
Smoke stack.....	28 48	
Diving.....	25 00	
Hardware.....	1 36	
Oil.....	50	
	<u>436 06</u>	
Cash Payments,	436 06	
Add amount transferred		
from:		
N'th pumping		
works.....	10.36	
Water works		
shops.....	9.14	
	<u>19 50</u>	
		<u>\$455 56</u>
Carried forward.		\$467,824 67

BOOKKEEPER'S STATEMENT.

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Brought forward. \$467,824 67

Acc't Water Service Cocks:

Paid for:

Corporation taps....	10,271 76
"W" covers.....	693 36
Labor.....	9,761 79
Repairing wagon....	15 25
Plumbing.....	208 96
Hardware.....	26 20
Tape lines and shovels.	73 05
Stop cock and patterns	13 00
Castings.....	6 50
Teaming.....	65 00
1 rubber stamp.....	1 75
Advertising.....	175 05
Rebate for serv'e pipe	
laid....	206 13
2 horses.....	300 00
Stationery and blanks	84 75

Cash payments..... 21,902 55

Add am't transferred
from:

Water Works

shops..... 104 83

Water Works

stables. 1,211 78

1,316 56 23,219 11
Acc't Fire Cisterns:

Paid for:

Labor.....	329 67
Bricks.....	30 00
Sewer pipe.....	13 24

Carried forward. \$ 372 91 \$491,043 78

Brought forward. \$ 372 91 \$491,043 78

Paid for:

Teaming.....	38 77
Sand.....	2 25
Cement.....	6 50
Plumbing.....	5 75

Cash payments..... \$ 426 18

Add amount transferred
from:

Water works shops.... 9 94

436 12

*Acc't New Engines, West Pump-
ing Works:*

Paid for Advertising.. \$ 305 44

Add amount transferred
from:

North pumping works. 23 63

329 07

Account Water Loan Interest:

Paid City Treasurer for
coupons paid.....\$ 40,300 00

Paid American Exch'ge
National Bank N. Y.,
for coupons paid 233,833 12

\$274 133 12

Account Water Office Expense:

Paid for:

Blanks, blank books and stationery.....	\$ 964 14
Candles.....	14 22
1 doz. chimneys.....	1 50

Carried forward \$ 979 86 \$765,942 09

BOOKKEEPER'S STATEMENT.

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Brought forward.	\$	979 86	\$765,942 09
Advertising		61 16	
Binding plat books and vouchers		108 91	
Postal cards and post- age stamps		270 70	
Coin wrappers and bags		13 70	
Car fares		751 50	
1 coin safe		9 00	
Locksmithing		8 50	
1 directory		5 00	
Seals and rubber stamps		26 50	
Tape lines		19 55	
Matches		52 80	
Sharpening erasers ..		80	
Extra services		400 30	
Hardware		18 20	
Tool cases		7 50	
1 pump		4 00	
			\$ 2,737 98

*Acc't Commissioners' and City En-
gineer's Office Expense:*

(WATER FUNDS PROPORTION.)

Paid for:

Blank books and sta- tionery	\$	474 88	
Postage stamps		268 50	
Subscription to news- papers		13 00	
Express charges		50	
3 directories		15 00	
Repairing surveyor's level		4 50	
			776 38

Carried forward. \$769,456 45

Brought forward. \$769,456 45

Account Water Office Salaries:

Paid:

Salaries of employees
in water office..... 58,322 86

Acc't Commissioners' and City Engineer's Office Salaries:

(WATER FUNDS PROPORTION.)

Paid:

Salaries of Commissioner, City Engineer,
secretary, bookkeeper and others..... 6,720 82

Acc't Iron Roof North Pumping Works:

Paid for:

Drawings 36 00
Advertising..... 14 88

50 88

Acc't Water Works Income:

Amount of water taxes
refun'd in cases where
two payments have
been made..... \$948 04

Acc't Miscellaneous Expenses:

Paid T. T. Gurney,
Comptroller, for holding
fractional currency
for the accommodation
of the water office during
the months of May
and November..... 1,000 00

Carried forward. \$1,000 00 \$835,499 05

BOOKKEEPER'S STATEMENT.

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Brought forward.	\$1,000 00	\$835,499 05
Paid F. C. Meyer, Book-keeper, for holding fractional currency for the accommodation of the water office during the months of May and November.....	1,000 00	
For wrenches returned	150 00	
Paid amount previously advanced to lay water pipe refunded in 1881:		
Chas. L. Epps.....	88 50	
Jacobson & Tallman..	2,000 00	
S. J. Bushnell.....	250 00	
D. W. Kerfoot.....	50 00	
J. B. Drake.....	150 00	
Barrett, Arnold & Kimball.....	200 00	
		\$4,888 50
Total Expenditures,		\$840,387 55

SEWERAGE FUND.

RECEIPTS.

<i>Acc't House Drains:</i>		
Am't rec'd for Drain permits.....	28,681 30	
Am't rec'd for drain layers licenses.....	81 00	
Am't rec'd from Thomas Dakin, forfeiture of contract.....	200 00	
Am't rec'd from Ed. Flannedy for labor...	34 73	
		\$28,997 03
Carried forward.		\$ 28,997 03

Brought forward. \$28,997 08

Acc't Cleaning Sewers and Catch-Basins:

Am't appropriated by City Council.....	36,000 00	
Am't rec'd from Illinois Leather Co. for labor	12 75	
Am't rec'd from appropriation fund for labor	50 67	
		\$36,063 42

Acc't Repairing Sewers and Catch-Basins.

Am't appropriated by City Council.....	6,000 00	
Am't rec'd from Peoples Gas Light and Coke Co for labor.....	18 40	
Am't rec'd from Sewerage Tax Fund charged in error.....	177 75	
		\$6,191 15

Acc't Street Intersections:

Am't appropriated by City Council.....	\$16,000 00
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Acc't Sewerage Salaries:

Am't appropriated by City Council.....	\$21,320 00
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Acc't Commissioners and City Engineers Office Salaries:

Am't appropriated by City Council(sewerage fund's proportion), .	\$7,600 00
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Carried forward.	\$116,171 60
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BOOKKEEPER'S STATEMENT.

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Brought forward....	\$116,171 60
<i>Acc't Sewerage Office Expense:</i>	
Am't appropriated by City Council.....	\$1,500 00
<i>Account Commissioners' and City Engineer's Office Expense:</i>	
Am't appropriated by City Council (Sewer- age Funds proportion)	500 00
<i>Account Sewerage and River Im- provement Sinking Fund:</i>	
Am't appropriated by City Council.....	\$1,000 00
<i>Account Deficiency in Collection of Taxes:</i>	\$2,248 00
Total Receipts	\$121,419 60

EXPENDITURES.

<i>Acc't House Drains:</i>	
Paid for labor.....	\$5,290 77
Sewer pipe.....	8,023 54
Sewer pipe used in 1880 and charged in 1881	4,860 33
Teaming	14 87
Advertising	88 73
Blank books and sta- tionery.....	156 05
Carried forward.....	\$18,434 29

Brought forward.....	\$18,424	29	
Binding records.....	7	25	
Rubber boots.....	12	00	
Fees for permits re-			
funded.....	12	50	\$18,466 04

Acc't Street Intersections:

Paid for labor	\$6,956	83	
Cement.....	1,268	15	
Sewer pipe.....	98	82	
Bricks.....	3,195	72	
Wooden covers	4,956	00	
Iron covers.....	246	24	
Sand	115	00	
Oil.....	4	20	
Teaming	1,600	57	
Cement used in 1880			
and charged in 1881.	1,166	10	
Sewer pipe used in			
1880 and charged in			
1881	94	82	
Bricks used in 1880			
and charged in 1881.	1,848	64	
Covers used in 1880			
and charged in 1881	2,986	35	
			24,537 44

Acc't Repairs Sewers—North Division:

Paid for labor.....	486	36	
Cement	16	90	
Bricks.....	26	00	
Sewer pipe.....	10	30	
Wood covers	40	00	
Carried forward.	\$579	56	\$43,003 48

BOOKKEEPER'S STATEMENT.

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Brought forward.	\$	579 56	\$43,003 48
Sand		5 00	
Teaming		107 74	
			\$692 30

Acc't Repairs Sewers—South Division:

Paid for labor	1,273 90	
Cement	101 40	
Bricks	140 50	
Sewer pipe	18 30	
Covers	55 00	
Sand	15 00	
Teaming	238 57	
Covers used in 1880 and charged in 1881.	65 00	
Cement used in 1880 and charged in 1881.	19 50	
Sewer pipe used in '80 and charged in 1881.	27 10	
Bricks used in 1880 and charged in 1881.	42 00	\$1,996 27

Acc't Repairs Sewers—West Division:

Paid for labor	2,262 95	
Oil	2 81	
Teaming	322 57	
Cement	171 60	
Bricks	461 20	
Sewer pipe	48 65	
Covers	175 00	
Sand	20 00	
Covers used in 1880 and charged in 1881.	10 00	
Cement used in 1880 and charged in 1881.	119 60	
Carried forward	\$3,594 38	\$45,692 05

Brought forward	\$3,594 38	\$45,692 05
Sewer pipe used in '80 and charged in 1881.	9 50	
Bricks used in 1880 and charged in 1881.	188 00	3,741 88

Acc't Cleaning Sewers—North Division:

Paid for:

Labor	\$5,105 80	
Candles	6 00	
For repairing flushing wagon	23 00	
Teaming	494 28	
		5,629 08

Acc't Cleaning Sewers South Div.

Paid for:

Labor	\$14,052 22	
Candles	12 00	
Oakum	5 50	
Repr'g flushing wag'n	40 00	
Teaming	1,871 91	
		15,981 63

Acc't Cleaning Sewers West Div.

Paid for:

Labor	\$11,176 49	
Repr'g flushing wag'n	70 00	
Axle grease	1 75	
Teaming	1,643 20	
		12,891 44

Carried forward		\$83,936 08
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'Brought forward \$83,936 08
Acc't Sewerage Stock.

Paid for:

Tools	\$1,177 96	
Repairing and sharp- ening tools	423 88	
Lumber	145 44	
Hardware	102 89	
Rubber goods	56 19	
Lanterns	48 05	
Rope	24 66	
~~Gas~~ pipe	33 60	
~~Two boats~~	20 00	
Letter press	11 75	
One chair	9 50	
		2,053 92

Acc't Sewerage Sinking Fund.

Paid to:

Sewer'ge Sinking F'nd for 1881	500 00	
River Improvement Sinking Fund for '81	500 00	
		1,000 00

Acc't Sewerage Office Expense.

Paid for:

Blank books, printing and station- ery	\$428 77	
Car-fares	340 00	
Draughting tools	11 85	
Locksmithing	2 70	
One city directory ...	5 00	
		788 32

Printing annual re- port		783 35
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Carried forward ...		\$88,561 67
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DEPARTMENT OF PUBLIC WORKS.

Brought forward.. \$88,561 67

*Acc't of Commissioners and City
Engineers Office Expense.*

(SEWERAGE FUND PROPORTION.)

Paid for:

Lithographing	\$269 50	
Postage stamps.....	68 00	
Draughting material.	10 50	
One tape line	2 50	
Blank books, blanks & stationery	137 50	
Sub. to newspapers..	9 75	
Binding contracts...	2 25	
		500 00

Acc't Sewerage Salaries.

Paid:

Salaries to employes. \$20,398 82

*Acc't Commissioners and City En-
gineers Office Salaries.*

(SEWERAGE FUND PROPORTION.)

Paid:

Salaries of Commis- sioner, City Engineer, Secretary, Book- keeper and others...	\$7,575 00
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Total expenditures.

\$117,035 49

SEWERAGE TAX FUND.

RECEIPTS.

Acc't Construction of Sewers.

Amount appropriated by		
City Council	\$200,000	00
Rec'd from, (amount advanced to construct		
sundry sewers):—		
Perkins Bass	2,577	34
A. McNally	803	27
Jas. McNally	51	55
Augustus Bauer	144	00
M. Kronberg	120	00
F. Wacker & Co...	96	00
Mead & Coe, Agents,	742	00
Catholic Bishop of		
Chicago	4,805	00
James Morgan	543	63
		209,882 79

Acc't Sewer Pipe.

Amount received from	
Sewerage Fund of 1880,	
for pipe used—	
On repairs of	
sewers	36.60
On intersect'ns	94.82
On house dr'ns	4,860.33
	4,991 75

Amount received from		
Sewerage Fund of 1881,		
for pipe used—		
Carried forward		
	\$4,991 75	\$209,882 79

Brought forward	\$4,991 75	\$209,882 79
On repairs of sewers	77.25	
On intersect'ns	98 82	
On house dr'ns	8,023.54	
	8,199 61	
		13,191 36

Acc't Sewer Bricks.

Amount received from
Sewerage Fund of 1880,
for bricks used—

On repairs of sewers	180.00	
On intersect'ns	1,848.64	
	2,028.64	

Amount received from
Sewerage Fund of 1881,
for bricks used—

On repairs of sewers	627.70	
On intersect'ns	3,195.72	
	3,823 42	
Am't rec'd for bricks sold...	10 00	
	5,862	

Acc't Wooden Covers.

Amount received from
Sewerage Fund of 1880,
for covers used—

On repairs of sewers	75.00	
On intersect'ns	2,986.35	
	3,061.35	

Carried forward	\$3,061 35	228,936 21
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BOOKKEEPER'S STATEMENT.

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Brought forward	\$3,061 35	228,936 21
Amount received from Sewerage Fund of 1881, for covers used—		
On repairs of sewers	270.00	
On intersect'ns	4,956.00	
		5,226 00
Amt. rec'd for lumber sold..	4 05	
		8,291 40
<i>Acc't Iron Covers.</i>		
Amount received from Sewerage Fund of 1881, for covers used on intersections....	\$246 24	
Amt. received for two iron covers sold	26 25	
		272 49
<i>Acc't Sewerage Cement.</i>		
Amount recd. from Sewer'ge Fund of 1880 for cem't used on repairs of sewers	139.10	
On intersect'ns	1,166.10	
		1,305 20
Amount recd. from Sewer'ge Fund of 1881 for cem't used on repairs of sewers	289.90	
On intersect'ns	1,268.15	
		1,558 05
		\$2,863 25
Carried forward		\$240,363 35

Brought forward \$240,263 35
Acc't Sand.

Amount receiv'd from Sewerage Fund of 1881 for sand used on repairs of sewers...	\$ 40 60	
On intersect'ns.....	115 00	
		155 00

Acc't Catch-basins.

Amount receiv'd from South Park Commis- sioners for construct- ing catch-basins. ..		\$2,888 15
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Total receipts \$243,406 50.

EXPENDITURES.*Acc't Sewers North Division.*

Paid for:

Labor.....	\$9,688 49	
Advertising	100 61	
Teaming	281 42	
Coal.....	4 40	
Bricks	13,233 59	
Sewer pipe.....	5,069 89	
Lumber....	93 48	
Cement	670 73	
Covers.....	350 00	
Catch-basins.....	2,110 27	
Sand	20 38	
Plumbing	110 35	
Tools and hardware..	26 88	
Money advan'ed ref'd	330 00	
Contractors	7,010 90	
		39,101 39

Carried forward \$39,101 39

Brought forward.... \$39,101 39

Acc't Sewers, South Division:

Paid for:

Labor	\$9,021 94	
Advertising	27 89	
Plumbing.....	455 20	
Teaming	3,774 21	
Removing piles.....	150 00	
Bricks.....	1,268 81	
Covers	1,045 00	
Cement.....	4,753 75	
Money advanced re-		
funded.....	46 25	
Catch basins.....	18,111 81	
Sewer pipe	9,873 51	
Sand.....	126 44	
Contractors	21,515 43	
		70,170 24

Account Sewers, West Division:

Paid for:

Labor	\$16,145 25	
Earth filling.....	1,908 60	
Advertising	127 56	
Plumbing.....	1,748 50	
Oil.....	6 50	
Teaming.....	1,884 42	
Bricks.....	77,380 95	
Covers	3,060 00	
Cement.....	21,111 25	
Money advanced re-		
funded	700 10	
Catch basins.....	9,174 57	
Sewer pipe.....	28,053 79	
Sand	73 18	
Contractors	68,793 40	230,168 07
Carried forward.....		\$339,439 70

Brought forward..... \$339,439 70

Acc't Miscellaneous Expenditures:

Paid for:

Sewer pipe used on intersections, repairs of sewers and house drains	\$3,199 61
Covers used on intersections and repairs of sewers	5,296 00
Cement used on intersections and repairs of sewers	1,558 05
Sand used on intersections and repairs of sewers	155 00
Sewer pipe on hand	2,870 34
Cement on hand	291 25

\$357,739 95

Deduct—

Bricks used in 1881, paid for in 1880	12,594 42	
Covers used in '81, paid for in 1880	527 91	
Pipe used in 1881, paid for in 1880	7,880 59	21,002 92

Total expenditures.

\$336,737 03

APPROPRIATION FUND.

RECEIPTS.

Acc't Streets, North Division:

(Cleaning and Repairing.)

Am't appropriated by City Council	\$35,000 00	
Am't received for re- paving	438 25	
Am't received from wa- ter fund for replacing pavement	114 50	
Am't received for 1 scale permit	3 00	35,555 75

Acc't Streets, South Division:

(Cleaning and Repairing.)

Am't appropriated by City Council	\$60,000 00	
Am't received for re- paving	2,128 25	
Am't received from wa- ter fund for replacing pavement.....	1,665 65	
Am't received for in- specting	30 00	
Am't received for pick axes sold.....	113 25	
Am't received for 1 scale permit	3 00	
Am't received for con- structing sidewalks..	293 83	64,233 98
Carried forward		\$99,789 73

Brought forward.	\$ 99,789 73	
<i>Acc't Streets, West Division:</i>		
(Cleaning and Repairing.)		
Am't appropriated by City Council	\$75,000 00	
Am't received for repaving.....	2,197 75	
Am't received from water fund for replacing pavement	7,745 50	
Am't received for scale permits	30 00	
Am't received for constructing sidewalks..	1,806 16	
Am't received from Police Department.....	3 50	
		86,782 91

Acc't Bridge Department:

Am't appropriated by City Council for repairs of bridges and viaducts.....	\$100,485 50	
Am't rec'd from sundry persons for damages to bridges.....	2,202 76	
Am't rec'd from Goodrich Trans. Co., for driving piles.....	46 45	
Am't rec'd from C. & N. W. R. R. Co., for repairs of N. State street viaduct.....	400 00	
Am't rec'd from Thomson & Reed, being $\frac{1}{3}$ cost of planking Polk street bridge...	157 13	
Carried forward.	\$103,291 84	\$186,572 64

BOOKKEEPER'S STATEMENT.

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Brought forward.	\$103,291 84	\$186,572 64
Am't rec'd from West Div. Railway Co., for widening Lake street bridge.....	349 72	
Am't rec'd for beams and scrap iron sold..	503 77	
Am't rec'd from Water Fund for re-laying sidewalk at Clybourn place tunnel and con- structing plank road- ways at North and West Pump'g Works.	1,098 10	
		105,243 43

Acc't Sangamon Street Viaduct:

Am't rec'd from railroad
companies, being their
proportion on cost of
sub-structure, paving
approaches and con-
structing of sidewalks,
and from other parties,
as follows:

P. C. & St. L.	
R. R. Co...\$	3,108.88
C. & N. W.	
R. R. Co...	252.40
O. M. & St.	
P. R.R. Co.	3,349.54
J. & M. C. Duf-	
fy, for use of	
st'm roller.	60.00
	6,770 82
Carried forward.	
	\$ 6,770 81 \$291,816 07

Brought forward.	\$	6,770 81	\$291,816 07
Am't rec'd from railroad companies, being total cost of superstructure, as follows:			
P. C. & St.			
L. R. R. Co.	\$	14,529.08	
C. & N. W.			
R. R. Co..		2,195.00	
~~Q. M. & St.~~			
P. R. R. Co.		16,317.62	
		33,041 70	
			39,812 52

Acc't Harrison Street Viaduct.:

Amt rec'd from railroad companies, being their proportion on cost of substructure, paving approaches, constructing sidewalks and raising buildings, as follows:

P. Ft. W. &			
C. R. R. Co.	\$	5,101.09	
C. & A. R.			
R. Co., (in-			
clud'g	\$	803.	
06 trans-			
ferred to			
Wat. Fund)		15,854.12	
C. B. & Q. R.			
R. Co.....		6,540.40	
		27,495 61	
Carried forward.	\$	27,495 61	\$331,628 59

Brought forward.	\$ 27,495 61	\$331,628 59
Am't rec'd from railroad companies, being total cost of superstructure, as follows:		
P. Ft. W. & C. R. R. Co.,	\$ 2,350.00	
C. & A. R. R. Co.....	29,425.00	
C. B. & Q. R. R. Co.....	18,100.00	
	49,875 00	
		77,370 61

Acc't Polk Street Viaduct:

Am't rec'd from C. B. & Q. R. R. Co., for inspecting, labor and material furnished...		2,158 57
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Acc't Twelfth Street Viaduct:

Am't rec'd from C. B. & Q. R. R. Co., for services of rodman..		7 00
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Acc't Cost of Special Assessments:

Am't rec'd from Special Assessment Fund.....		28,321 70
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Acc't Public Benefits:

Am't approp'd by City Council.....	188,500 00	
Am't rec'd from Special Assessment Fund....	7,732 44	
Am't rec'd from Police Department.....	3 50	
		196,235 94
Carried forward.		
		\$635,722 41

Brought forward.	\$635,722 41
<i>Acc't Street Lamps:</i>	
Am't received from Special Assess't Fund.	525 00
Am't rec'd from Klee & Taussig, for 1 horse sold.....	35 00
Am't received from John Stewart for 1 wagon sold.....	11 50
Am't received from Wm. Kussel, damage to lamp post.....	6 00
Am't rec'd from U. S. Clothing Co., for lab'r.	1 00
Am't rec'd fr'm Chicago Gas Light & Coke Co., for lamps.....	7 00
Am't rec'd from Blake, Shaw & Co., for reset- ting lamp posts....	19 87
Am't rec'd from Rust & Coolidge, for lab'r and material furnished...	170 45
Am't rec'd from Cun- ningham & Keepers, for labor and material furnished.....	191 20
Am't rec'd from Water Fund.....	11 15
Am't rec'd from Street Lamp Fund.....	11,312 30
	\$ 12,290 47
Carried forward.	\$ 648,012 88

BOOKKEEPER'S STATEMENT.

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Brought forward.	\$ 648,012 88	
<i>Acc't Public Buildings:</i>		
Amo'nt appropriated by		
City Council.....	10,920 00	
Am't rec'd from Cook		
County:		
Rent to June		
30, 1880...	1,800.00	
Rent to Dec.		
31, 1880..	1,800.00	
Heating, to		
Oct. 31, 1880	1,088.82	
	4,688 82	
		15,608 82
<i>Acc't Planking Canal Street:</i>		
<i>(At Harrison Street Viaduct.)</i>		
Amount rec'd from Con-		
tingent Fund.....		436 30
<i>Acc't Sidewalks, West Division:</i>		
Am't appropriated by		
City Council.....	3,000 00	
Am't received from sun-		
dry persons for labor		
and material furn'd..	37 60	
	3,037 60	
<i>Acc't Miscellaneous Appropriat'ns:</i>		
Am't appropriated for:		
Washington st. tunnel	5,418 64	
LaSalle street tunnel.	7,358 54	
Chicago harbor.....	52,520 00	
Bridgeport pumping		
works.....	75,000 00	
Bridge tenders sal'ries	45,273 90	
Carried forward.	\$185,571 08	\$ 667,095 60

Brought forward.	\$185,571 08	\$367,025 60
Bridge on Ogden alip	3,650 00	
Bridge on Western av.	3,000 00	
Bridge on Kedzie ave.	4,700 00	
Fullerton ave. conduit	20,985 89	
Sidewalks N. Division	1,500 00	
Sidewalks S. Division	3,000 00	
Street cleaning (spec'l appropriation).....	15,000 00	
Lake park.....	2,000 00	
Ellis park.....	500 00	
Union park.....	2,500 00	
Vernon park.....	1,000 00	
Jefferson park.....	1,500 00	
Wicker park.....	1,000 00	
Washington square..	1,000 00	
Donglas Monument square.....	500 00	
Oak park.....	150 00	
Green Bay park.....	150 00	
Street signs.....	600 00	
Salaries.....	26,070 00	
Salaries,(Commissioner, City Eng'r et al.)	7,600 00	
Commissioner's and City Engineers office expense.....	500 00	
Street Department office expense.....	500 00	
Map Department office expense.....	200 00	
Deficiency in collection of taxes.....	14,502 06	
		\$296,679 03

Total Receipts,

\$963,774 63

BOOKKEEPER'S STATEMENT.

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EXPENDITURES.

Acc't Streets, North Division:

Paid for:

Labor (cleaning and repairing).....	19,051 37	
Lumber.....	1,629 44	
Hardware.....	193 65	
Brooms	20 00	
Paving Blocks.....	2,235 50	
Gravel.....	90 00	
Plow.....	31 50	
1 road mak'g mach'ne	150 00	
Cleaning vault.....	12 00	
Advertising.....	145 87	
Contractors, cleaning streets.....	4,292 71	
		\$27,852 04

Acc't Streets, South Division:

Paid for:

Labor (cleaning and repairing.).....	43,093 73	
Lumber.....	3,757 00	
Hardware	900 83	
Tools and repairing..	409 76	
Gravel.....	228 00	
Brooms	24 00	
Paving blocks.....	309 00	
Cleaning vaults.....	22 00	
Advertising.....	54 69	
1 plow	31 50	
Rebate on paving....	85 00	
Contractors, cleaning streets.....	20,304 16	
		\$69,219 67

Carried forward.		\$97,071 71
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Brought forward. \$97,071 71

Acc't Streets, West Division:

Paid for:

Labor (cleaning and	
repairing.....	49,414 53
Lumber	7,064 66
Hardware	1,027 33
Tools and repairing..	189 10
Stone	1,886 98
Cinders	1,411 90
Paving blocks.....	3,161 20
Gravel.....	300 00
Brooms	12 00
Coal.....	32 40
Packing.....	2 97
Blacksmithing.....	16 62
Paint and oil	8 30
Advertising	66 69
Rent of yards.....	96 08

Contractors, cleaning	
streets.....	11,095 60

\$75,786 36

Acc't Special Appropriation:

Paid for:

Cleaning sts. in March	\$15,000 00
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Acc't Bridge Department:

(General Repairs on Bridges.)

Paid for:

Lumber.....	21,290.97
Piles, driving	
and pulling	
same.....	3,193.51
Blacksmithing	3,784.28

Car'd for'd. 28,268.76

\$187,858 07

BOOKKEEPER'S STATEMENT.

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Bro't for'd.	\$28,268.76	\$187,858 07
Paid for:		
Labor.....	27,518.91	
Hardware.....	1,155.11	
Oil, lamps, lanterns, &c....	874.59	
Tools.....	170.00	
Teaming.....	81.00	
Stone.....	112.88	
Castings.....	107.49	
Iron.....	150.80	
Wheelbarrows.	20.00	
Bridge bells..	40.50	
Clocks.....	24.50	
Bridge balls..	39.35	
Chain, rope, brooms.....	219.57	
Coal.....	776.73	
Cement.....	22.25	
1 scow.....	250.00	
Oars.....	22.08	
Repairi'g scow	39.50	
Repair'g b'dge houses.....	15.00	
Rent of bridge house lots...	147.50	
Damage to vessels.....	870.51	
Stoves and repairing.....	52.50	
1 steel washer.	17.50	
Use of tugs and scows.....	165.90	
Printing and advertising..	97.90	
Carried for'd	\$60,760.33	\$187,858 07

Brought forward \$89,700.33 \$167,888 07

Paid for:

Hack hire.....	3.00	
Expr's charges	2.00	
\$	_____	00,705 33

(General Repairs on Viaducts.)

Paid for:

Labor.....	9,863.26	
Lumber.....	5,009.45	
Hardware.....	254.52	
Printing and advertising..	35.28	
Painting.....	1,286.90	
Teaming.....	40.34	
	_____	16,579 75

*(Reconstructing S. Halsted
St. Viaduct):*

Paid Leighton

Bridge and

Iron works..16,990.00

Paid for:

Advertising...	47.75	
Labor.....	289.63	
Lumber.....	126.54	
Cement.....	6.25	
Paving ap- proaches	128.25	
Teaming.....	81.31	
Traveling ex- penses.....	16.00	
	_____	17,685 73

_____ \$95,030 81

Carried forward.

_____ \$282,888 88

BOOKKEEPER'S STATEMENT.

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Brought forward. \$282,888 88

Acc't Cost of Special Assessments:

Paid County Treasurer,
commission on collec-
tions..... 10,299 52

Paid Commis'ners mak-
ing assessments 4,222 50

Paid for:

Advertising..... 7,350 25

Printing and station-
ery..... 615 10

Printing maps..... 75 00

County Clerk's fees.. 2,542 75

Copying tax warrants 222 50

Stamped envelopes.. 310 80

Car fares for juries
and employes..... 21 50

1 directory..... 5 00

Services of experts, ap-
praisers and inspec-
tors..... 2,616 00

Subscription to Legal
News..... 4 40

\$28,285 32

Acc't Public Buildings:

Paid for:

Labor, (w a t c h m e n,
janitors, cleaners,
carpenters, engineer
and firemen..... 6,867 64

Plumbing..... 255 22

Steam and gas fitting 246 14

Calcimining..... 774 43

Wire railings..... 135 20

Carried forward. \$ 8,278 63 \$311,174 20

Brought forward. \$ 8,278 63 \$311,174 20

Paid for:

Glass and putty.....	31 40	
Carpets and matting.	617 06	
Lumber.....	324 25	
Brooms, dusters, soap and pails.....	119 72	
1 ventilator.....	5 00	
Hardware.....	119 00	
Cement.....	1 30	
Fire brick and clay..	31 00	
Repairing boiler and engine.....	417 64	
Fire tools.....	6 67	
Sprinkling.....	382 00	
Alcohol, oil and var- nish.....	37 42	
Ice.....	75 37	
Lamp chimneys and burners.....	16 60	
Salt.....	2 30	
Repairing roof.....	109 50	
Office furniture.....	291 43	
Awnings.....	16 50	
Repairing sewer.....	15 63	
Coal.....	1,921 51	
Lettering signs.....	16 00	
Gas.....	2,114 65	
Locksmithing.....	61 26	
Repairing clock.....	3 00	
Teaming.....	1 20	
Advertising.....	10 31	
		\$15,026 35
Carried forward.		\$326,200 55

BOOKKEEPER'S STATEMENT.

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Brought forward. \$326,200 55
Acc't Sangamon Street Viaduct:

Paid for:

Masonry and filling..	24,327 55	
Paving approaches...	8,231 99	
Raising buildings...	17,156 34	
Construct'g sidew'ks.	2,244 52	
Inspecting and labor.	1,410 67	
Advertising.....	143 97	
Plumbing.....	253 42	
Lumber.....	531 27	
Moving catch-basins.	41 75	
Drain tile.....	4 64	
Hardware.....	32 75	
Coal.....	6 60	
Gravel.....	7 00	
Teaming.....	27 21	
Hose.....	6 67	
Superstructure.....	33,041 70	
		\$87,468 05

Acc't Harrison Street Viaduct:

Paid for:

Masonry and filling..	27,839 05	
Paving approaches...	10,514 25	
Raising buildings...	4,101 00	
Construct'g sidew'ks.	1,378 16	
Inspecting and labor.	913 75	
Lumber.....	718 35	
Plumbing.....	15 97	
Hardware.....	13 83	
Coal.....	6 60	
Advertising.....	79 38	
Superstructure.....	49,875 00	
Water fund (credited this acc't in error)..	803 06	
		\$96,258 40

Carried forward. \$509,927 00

Brought forward. \$509,927 00

Acc't Fullerton Avenue Conduit:

Paid for:

Labor.....	7,492 80	
Coal.....	5,284 64	
Lead, oil and glass...	573 43	
Gasket, packing and waste.....	58 38	
Hose.....	64 36	
Fire bricks and clay..	29 00	
Brooms and brushes.	6 70	
Steam jet tubes.....	24 00	
Cement.....	3 85	
Hardware.....	4 13	
Pipe and fittings....	17 48	
Soap.....	10 00	
Zinc.....	1 35	
Teaming.....	4 97	
Advertising.....	10 81	
Frame shed.....	12 00	
Chimneys and burners	39 24	
Stationery.....	85	
Repairing boilers....	104 30	
Tools and repairing..	46 29	
Repairing gauge.....	14 00	
Repairing telephone.	3 95	
Four reflectors.....	3 00	
Hack hire.....	59 00	
Experts, test'g engin's	500 00	
Bal. due on machinery	5,900 50	
Testing scales.....	8 00	
Copper work.....	85 18	
Covering steam pipe.	16 00	
		\$ 20,378 21

Carried forward. \$530,305 21

Brought forward. \$530,305 21

Acc't Street Lamps:

Paid for:

Labor.....	3,136 50
Glass.....	3,199 42
Lamp posts.....	2,078 00
Lamp sockets.....	998 40
Lamp fixtures.....	1,177 13
Lamps.....	482 00
Oil, lead and varnish,	93 21
Solder.....	93 00
Coke.....	28 00
Tin.....	278 35
Charcoal.....	74 24
Hardware.....	21 00
Lava Tips.....	44 00
Tools.....	93 80
Drilling holes.....	9 24
Cutting glass.....	26 50
Shop rent.....	120 00
Stabling and horse	
feed.....	118 00
Horseshoeing.....	35 38
Wagon cover.....	4 50
Repairing wagon....	27 00
Teaming.....	32 00
Iron work.....	20 80
1 horse.....	100 00
	\$ 12,290 47

Acc't Washington Street Tunnel:

Paid for:

Labor.....	1,456 30
Paving roadway.....	4,081 25
Carried forward.	\$ 5,537 55
	\$542,595 68

Brought forward. \$ 5,537 55 \$542,595 68

Paid for:

Oil and alcohol.....	53 30	
Coal.....	88 00	
Whitewashing.....	212 49	
Gas and steam fitting	53 33	
Salt.....	6 40	
1 globe valve.....	1 30	
Lamp globes.....	9 00	
Slabs.....	3 50	
Brooms and brushes.	6 50	
Lumber.....	6 76	
Hardware.....	22 62	
Plumbing.....	9 20	
Waste.....	2 50	
Soap and alum.....	1 43	
Teaming.....	12 67	
Repairing engine....	10 75	
Mattress and bed ...	4 50	
		\$ 6,041 80

Acc't La Salle Street Tunnel:

Paid for:

Labor.....	1,253 33
Paving roadway.....	5,201 15
Whitewashing.....	212 51
Repairing walls.....	51 80
Repairing boiler and machinery.....	17 98
Steam and gas fitting.	4 32
Flues for boiler.....	95 80
Smoke stack.....	76 00
Anchor irons.....	16 90
Coal.....	52 80
Belting.....	26 00
Alcohol, oil, etc.....	16 90

Carried forward. \$ 7,025 49 \$548,637 48

BOOKKEEPER'S STATEMENT.

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Brought forward.	\$ 7,025 49	\$548,637 48
Paid for:		
Lamp globes.....	9 00	
Waste	1 30	
Hardware	3 70	
Brooms.....	1 25	
Sprinkling roadway..	6 00	
Painting signs	3 00	
		\$ 7,049 74

Acc't Chicago Harbor:

Paid for:		
Harbor Master's salary, and labor.....	2,753 10	
Use of tug.....	304 06	
Removing obstruct'ns	320 60	
Building dock.....	480 25	
Repairing dock.....	342 10	
Dredging	330 40	
Taking soundings...	7 50	
Repairing boat.....	12 00	
Special police services	75 00	
Pipe fittings.....	78	
Advertising	111 20	
Traveling expenses to Riverside and Summit.....	12 12	
		\$ 4,749 11

*Acc't Planking Canal Street:**(At Harrison Street Viaduct.)*

Paid for:		
Labor.....	159 62	
Lumber.....	259 78	
Hardware.....	16 90	
		\$ 436 30

Carried forward.	\$560,872 63
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Brought forward. \$560,872 63

Acct. Bridgeport Pumping Works:

Paid for:

Advertising	93 34	
Printing specificat'ns.	12 00	
On account of ma-		
chinery	24,650 00	
For draughting plans.	300 00	
Labor	164 50	
Repairing transit....	1 50	
Teaming	1 69	
		25,223 03

Acct. Lake Park:

Paid for:

Keeper's salary and		
labor	1,688 74	
Lawn mower and seed.	26 79	
Oil	3 75	
		1,719 28

Acct. Union Park:

Paid for:

Keeper's salary and		
labor	\$1,806 21	
Coal	17 60	
Hardware	14 20	
Feed for animals....	164 53	
White lead	18 36	
Plumbing	24 80	
Lawn grass seed	4 65	
Lumber	4 25	
Preserving plants ...	6 00	
Lawn mower and re-		
pairing	22 99	
Carried forward.	\$2,083 59	\$567,814 94

BOOKKEEPER'S STATEMENT.

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Brought forward.	\$2,083 59	\$587,814 94
Tools and repairing..	16 36	
Glazing.....	2 42	
		2,102 37

Acct. Jefferson Park:

Paid for:

Keeper's salary and labor	\$1,148 50	
Coal	4 40	
Plumbing.....	37 25	
Feed for animals....	7 50	
Preserving plants....	5 00	
Oil.. ..	4 65	
Hardware	7 30	
		1,214 60

Acct. Vernon Park:

Paid for:

Keeper's salary and labor	996 75	
Feed for animals....	12 37	
		1,009 12

Acct. Wicker Park:

Paid for:

Keeper's salary and labor	\$ 720 00	
Coal	9 10	
Sprinkler	4 00	
Feed for animals....	6 25	
Paint	1 85	
Lawn mower & grass seed	23 25	
Tools.....	7 10	
		771 55

Carried forward.		\$592,912 58
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Brought forward.		\$592,912 58
<i>Acct. Ellis Park:</i>		
Paid keeper's salary...		550 00
<i>Acct. Washington Square:</i>		
Paid for:		
Keeper's salary and labor	\$ 823 75	
Coal	3 50	
Hardware	9 35	
Plumbing	2 59	
Grass seed	1 75	
Oil	1 60	
Lumber	44 62	
Hose and couplings..	10 80	
2 lamp posts	100 00	997 96
<i>Acct. Oak Park:</i>		
Paid for labor		55 50
<i>Acct. Douglas Monument Square:</i>		
Paid keeper		500 00
<i>Acct. Sidewalks—North Division:</i>		
Paid for labor		1,065 55
<i>Acct. Sidewalks—South Division:</i>		
Paid for:		
Labor	\$1,135 51	
Lumber	300 30	1,435 81
<i>Acct. Sidewalks—West Division:</i>		
Paid for labor		2,145 56
Carried forward.		\$599,662 96

Brought forward. \$599,662 96
Acct. Kedzie Avenue Bridge:

Paid:

Massillon Bridge Co.	\$3,765 00	
For lumber	219 36	
Running ferry boat..	65 00	
Labor	296 96	
Advertising	49 75	
Hardware	3 25	
		4,399 32

Acct. Polk Street Viaduct:

Paid for:

Printing specificati'ns	\$ 16 00	
Advertising	23 28	
Inspecting and labor.	1,441 36	
Lumber	1,075 58	
Hardware.....	51 50	
Felt.....	18 45	
Traveling expenses ..	11 93	
		2,638 10

Acct. Twelfth Street Viaduct:

Paid for rodman's services

7 00

Acct. Public Benefits:

Paid for:

Improving city's portion (intersections) of streets paved during the year	195,667 04
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Acct. Stock:

Paid for:

Gaskets and repairs of steam roller	21 30
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Carried forward. \$802,395 72

Brought forward.	\$802,395 72
<i>Acct. Permit Depositors:</i>	
Paid:	
Sundry persons rebates on deposits.....	6 50
<i>Acct. Street Signs:</i>	
Paid for:	
Lettering signs	109 03
<i>Acct. Bridge Tenders' Salaries:</i>	
Paid:	
Bridge tenders' sala- ries	45,273 90
<i>Acct. City Office Salaries:</i>	
Paid:	
Employees in street department.....	11,700 00
Employees in special assm't department..	11,287 50
Employees in map de- partment	2,850 00
Employees in commis- sioner's office.....	220 00
	26,057 50
<i>Acct. Commissioners and City En- gineer's Office Salaries:</i>	
(Appropriation funds proportion.)	
Paid:	
Salaries of Commis- sioner, City Engin- eer, Secretary, Book- keeper, and others..	7,620 64
Carried forward.	\$881,463 29

Brought forward. \$881,463 29

Acct. Commissioners and City Engineer's Office Expense:

(Appropriation funds proportion.)

Paid for:

Stationery	397 87	
Printing blanks and notices	118 36	
Blank books and binding	56 52	
Postage stamps	145 55	
Car fares	10 00	
Repairing surveyors' instruments	8 00	
Draughting material.	2 25	
Locksmithing	3 50	
Map mounting	1 75	
1 stamp and ribbon..	4 00	
Subscription to newspapers	3 25	
Labor	27 38	
Carriage hire	7 00	
		785 43

Acct. Street Department Office Expense:

Paid for:

Stationery, printing, and blankbooks	204 07	
Car fare	95 00	
Draughting tools....	2 95	
1 directory	5 00	
Hardware	18 10	325 12

Carried forward. \$882,573 84

Brought forward.	\$882,573 84
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Acc't Map Dept. Office Expenses.

Paid for:

Drawing paper.....	\$30 00	
Drawing tools.....	24 15	
Stationery	6 30	
Binding atlases.....	24 00	
One directory.....	5 00	
		89 45

Total expenditures,	<u>\$882,663 29</u>
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CITY HALL FUND.

RECEIPTS.

Amt. appropriated for 1881	\$287,696 50
Amt. recd. from John Sackley for forfeiting contract.....	200 00
Amt. recd. from John- son & Co. for forfeit- ing contract.....	200 00
Amt. trans. from pub- lic buildings.....	1,217 10
Total receipts.....	<u>\$289,313 60</u>

EXPENDITURES.

Paid:

Johnson & Co. on ac- count of contract for fire proofing.....	\$15,431 07
Carried forward.	15,431 07

Brought forward.	\$15,431 07
Thomlinson & Reed on acct. of contract for cut stone work..	73,000 00
Thomlinson & Reed in full of contract for removing abut- ments and making return piers in alley from Randolph to Washington streets.	25,519 65
Durh'm House Drain- age Co. on acct. of contract for sewer and ventilating pipes	5,057 50
A. E. Fortin, in full of contract for tem- porary doors & win- dows	3,816 50
H. A. Streeter on acct. of contract for iron beams, iron trusses, T iron and skylights	31,924 96
P. J. Sexton, on acct. of contract for iron- work on rotunda...	2,125 00
John Davis & Co. on acct. of contract for steam heating appar- tus.....	26,888 25
John Angus on acct. of contract for brick work	19,787 85
Wm. McNeil & Son in full of contract for cut stone work on ro- tunda	995 00
Carried forward.	\$204,545 78

Brought forward. \$204,545 78

Miscellaneous Expenses.

Paid for:

Services of draughts-		
men, inspectors, and		
labor	\$13,071	38
Clamps, anchors and		
other iron work	3,198	78
Painting iron work..	1,209	50
Rope and pullies....	329	13
Hardware.....	43	28
Tools.....	97	62
Lumber	189	83
Steel	5	53
Oil.....	4	98
Coal	23	00
Stove and pipe.....	16	00
One-half cost piling		
for dome.....	4,544	37
Hoisting iron.....	541	25
Teaming.....	285	00
Plumbing.....	71	77
Examining building.	50	00
Advertising	144	54
Printing specificati'ns	24	00
Stationery, draught-		
ing material and box		
for plans	232	18
	24,082	14

Total expenditures \$228,627 92

Respectfully submitted,

F. C. MEYER,

Accountant.

